2020 VISION
FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT

Sustainable Food Security for All by 2020

Proceedings of an International Conference

September 4–6, 2001
Bonn, Germany

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INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

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Foreword

In 1995, the International Food Policy Research Institute's (IFPRI's) 2020 Vision for Food, Agriculture, and the Environment Initiative held its first international conference, which articulated a global vision for eliminating food insecurity. Since then, profound developments have occurred with extraordinary implications for global food security prospects, compelling IFPRI and its 2020 Vision Initiative to hold a second conference, entitled "Sustainable Food Security for All by 2020," in Bonn, Germany, on September 4–6, 2001. The ultimate objective of the Conference was to influence and catalyze action by key actors—including governments, international aid agencies, nongovernmental organizations, business and industry, and media—to achieve sustainable food security for all by 2020.

Over 900 individuals from 71 countries participated in the Conference. One-quarter of the participants were from developing countries, and 40 percent were female. A wide variety of stakeholders came together—one-quarter of the participants were from nongovernmental organizations, one-fifth from government, one-tenth from media, and just over one-twentieth from business and industry. In addition, the Conference attracted very senior policymakers.

The Conference began by taking stock of the current situation and prospects for the future. The second part, or heart, of the Conference focused on four key emerging forces: (i) demographic, health, and nutrition forces; (ii) economic forces; (iii) technological and environmental forces; and (iv) sociopolitical forces (see Appendix 1 for Conference program). The third and final part built on the action items identified in the previous sessions but focused on the larger issues of setting the priorities for action and identifying the roles and responsibilities of key actors.

This proceedings volume compiles the presentations made by the 73 speakers and chairs (see Appendix 2 for biographical notes) and synthesizes the discussions held throughout the three days. Note that these presentations have been transcribed and lightly edited. All speakers and chairs were invited to submit written summary notes for distribution during the Conference. These are available on the Conference website at http://www.ifpri.org/2020conference; we encourage you to consult them for more information. In certain cases, for those who were unable to present their summary note or whose presentation significantly differed from the written note, summary notes are included in Appendix 3.

Several auxiliary activities complemented the Conference program, highlights of which are included in this volume. Poster and essay competitions invited young people from around the world to share in pictures and in words how they saw our world in 2020. Throughout the Conference, an electronic voting system quickly gauged the participants' views on key topics, subsequently catalyzing debates and discussions. An African artist was commissioned to create comic strips depicting his perspective on relevant topics.

A variety of outlets were used to extend the reach of the Conference. About 80 journalists from around the world participated in several press conferences. Summaries of the proceedings and press articles were distributed to leading radio stations and print and electronic media outlets throughout the world. The

Conference participants peruse the table of IFPRI publications prepared for the Conference.

Conference speakers address the media during one of the press conferences.

Conference website was effectively used prior to, during, and after the Conference to raise public awareness, undertake polls on food security issues, and share Conference outputs.

In conjunction with the Conference, the 2020 Vision Initiative commissioned IFPRI staff and other leading experts around the world to undertake research and syntheses on several key topics, producing a number of new 2020 publications (see Appendix 4). In addition, an action plan was drafted and presented at the Conference. With feedback from the participants and many others, the document has been revised and published. While it reflects the helpful advice received on the draft, it does not represent a consensus as such; rather, it reflects IFPRI's best judgment, as an institution, about the driving forces influencing the long-term prospects for food security and the actions needed over the next two decades to free humanity from the scourge of hunger.

Follow-up activities to the Conference are underway, including the creation of a Bonn Food Policy Circle, an action group of high-level policymakers in government and international institutions and other eminent personalities; an independent impact assessment of the Conference conducted via a questionnaire to participants (the report is available on the website); exploration of areas for further IFPRI research that emerged during the Conference; and presentation of the outcomes of the Conference to audiences around the world.

IFPRI and the 2020 Vision Initiative take great pride in having organized this Conference in collaboration with partners from the public sector, private sector, and civil society, and warmly thank the Government of the Federal Republic of Germany and the other cosponsors for their support: German Federal Ministry for Economic Cooperation and Development (BMZ); German Foundation for International Development (DSE-ZEL); German Agency for Technical Cooperation (GTZ-BEAF); Aventis CropScience; CARE; Cargill; Deutsche Welthungerhilfe; EuronAid; International Fund for Agricultural Development (IFAD); Mellemfolkeligt Samvirke; Syngenta; and World Vision. In addition, we express our appreciation to the following agencies that provided support for developing-country participants to attend the Conference: Canadian International Development Agency (CIDA)/Agence Canadienne de Développement International (ACDI); Centre Technique de Coopération Agricole et Rurale (CTA); Ford Foundation – Beijing; Ford Foundation – New Delhi; and Novartis Foundation for Sustainable Development.

We thank the Conference Advisory Committee for providing guidance in the design and preparation of the Conference. We are extremely grateful to the chairs, speakers, and panelists for their active involvement in the program and for sharing their knowledge and perspectives, contributing to a very rich and stimulating meeting. Special thanks to Eleni Gabre-Madhin for performing the duties of

Master of Ceremonies with great eloquence and ease and for effectively keeping the program flowing smoothly. We express our sincere appreciation to our colleagues throughout IFPRI, in particular Klaus von Grebmer and the entire Communications Division, for their unflagging support and contributions. We also thank Laurie Goldberg and Simone Hill Lee for going beyond the call of duty to efficiently coordinate and handle the complex logistical details in the preparations for and implementation of an international conference of this magnitude and scope. Vickie Lee's assistance is also warmly acknowledged. We are extremely grateful for the unwavering support and efforts of Evelyn Banda, Uday Mohan, and Heidi Fritschel in the timely production of all of the publications for the Conference. We were pleased to be able to gather a unique, committed, and enthusiastic team to assist with the logistics of the Conference in Bonn, and extend our deepest thanks to the IFPRI members of the Conference team as well as to the team members in Germany for keeping the Conference running smoothly. We offer our appreciation to the Mayor of Bonn, the Federal Ministry for Economic Cooperation and Development, and the German Foundation for International Development for hosting receptions for Conference participants. In addition, we express our sincere gratitude to H.-Jochen de Haas, Jürgen Richter, and Petra Kade for their exceptional support from the very beginning of this Conference activity. Finally, our heartfelt thanks go to Jenna Kryszczun for providing extraordinary and invaluable support in all of the programmatic and organizational activities before, during, and after the Conference. We particularly appreciate Jenna's leadership in organizing and compiling this proceedings volume, which entailed, among other things, overseeing the transcription and editing of the presentations, coordinating reviews with the presenters, preparing the highlights of the discussion sessions, and assembling the myriad components in such a way that the volume captures the fullness and intensity of these three days.

By every measure, the Conference was a tremendous success. It brought new information, new ideas, new perspectives, and new actors with regard to global food security to the forefront, it helped to further knowledge on emerging developments and on priority actions required to assure sustainable food security, and, by attracting participation from all stakeholder groups and facilitating different perspectives to be heard, it encouraged dialogue and debate between traditional and new stakeholders. We thank all of those who participated for their contributions. This proceedings volume aims to not only share the richness and excitement of the event but also to rekindle and maintain the sense of urgency generated at the Conference for achieving sustainable food security for all by 2020.

Per Pinstrup-Andersen
Director General, IFPRI

Rajul Pandya-Lorch
Head, 2020 Vision Initiative, IFPRI

Acronyms and Abbreviations

ACP	African, Caribbean and Pacific Group of States
ADB	Asian Development Bank
AGOA	African Growth and Opportunity Act
CGIAR	Consultative Group on International Agricultural Research
CIMMYT	International Maize and Wheat Improvement Center
EC	European Commission
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GATT	General Agreement on Tariffs and Trade
GDP	Gross domestic product
GMO	Genetically modified organism
GNP	Gross national product
HLS	Household/livelihood security
ICLARM	International Center for Living Aquatic Resources Management
ICRAF	International Centre for Research in Agroforestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IIASA	International Institute of Applied Systems Analysis
ILO	International Labour Organization
IMF	International Monetary Fund
IMPACT	International Model for Policy Analysis of Agricultural Commodities and Trade
IPCC	Intergovernmental Panel on Climate Change
IRRI	International Rice Research Institute
IUCN	World Conservation Union
IWMI	International Water Management Institute
LDCs	Least-developed countries
NGDO	Nongovernmental development organization
NGO	Nongovernmental organization
ODA	Official development assistance
OECD	Organization for Economic Co-operation and Development
OPEC	Organisation for Petroleum Exporting Countries
R&D	Research and development
SDR	Special drawing rights
SOFI	*The State of Food Insecurity in the World* (FAO)
SPS	Sanitary and phytosanitary
TRIPS	Trade-related Aspects of Intellectual Property Rights
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organization
WHO	World Health Organization
WTO	World Trade Organization

Part 1

Introduction

Chapter 1

Welcome and Opening Remarks

President Johannes Rau of the Federal Republic of Germany opens the three-day Conference.

Chair: Geoff Miller

Chair of the Board of Trustees,
International Food Policy Research Institute

We are gathered here at the outset of this Conference with at least two things in common. First, each and every one of us shares a moral imperative: it is not okay that 800 million people, one-eighth of humanity, lack the food they need to live healthy, productive lives. To each and every one of us here, it is not okay that 170 million children suffer from malnutrition serious enough to jeopardize their chances to become healthy adults.

Second, we share a relationship to the International Food Policy Research Institute (IFPRI). You are customers of IFPRI. And as customers of IFPRI, if you leave this Conference having learned more about IFPRI's products and having gained greater insight into what you can do in your respective roles—wherever they are, from a village to an international organization—then we will go away from the Conference pleased at the outcome. In turn, if you've told us at IFPRI what we can do to better serve you, we will have achieved a great deal.

At the outset, I would like to express our appreciation to the Government of Germany and the City of Bonn for the excellent facilities they have provided to us, for the hospitality they have extended, and for their sponsorship. The large number of sponsors of this Conference also deserve our gratitude.

H.E. Johannes Rau

President, Federal Republic of Germany

In the last century, science and research have brought us technical advances no one would previously have thought possible.

The fantasy novels of Jules Verne have long since become reality, indeed they have been overtaken by reality. Today, travelling around the world in eighty days is no longer anything spectacular. Today, even a flight to the moon barely captures our attention. Some expect space travel to be a major branch of tourism in the future.

Today, it is multinational companies and not kingdoms on which the sun never sets. Today, seven-figure sums are sent around the globe every second. We no longer even bat an eyelid.

A so-called global awareness has emerged in the process, an awareness of global responsibility. If there is a natural disaster anywhere in the world, a flood or a storm or a month-long drought, we are happy to donate to help alleviate the suffering. That is the right thing to do and we have to keep doing it.

But amidst all the progress we have achieved, we still have not managed to eradicate hunger in the world. The figures speak for themselves, revealing the true horror. According to statistics from the Food and Agriculture Organization of the United Nations (FAO), more than 800 million people suffer from chronic hunger, and 24,000 people die every day from the consequences of hunger, three-quarters of whom are children under five. Twenty-four thousand people dying of starvation every day, that means a city like Bonn would die out within a fortnight. The figures are shocking but they do not shock us. We do not read or hear much about the situation. Or we turn a blind eye. There is a simple reason for that. "Normal" events, the daily grind, are not interesting for the media. Clearly, we as a global society have gotten used to 18,000 children under five starving to death every day. But this is not normal. This is not an inexorable fate. We can change that.

Sometimes one would think we had thrown in the towel and given up the fight against hunger in the world. The participants in the 1974 World Food Conference still believed they could eradicate hunger within 10 years. This optimism has faded.

Clearly, we as a global society have gotten used to 18,000 children under five starving to death every day.

The first question I ask, and I am not alone here, is: why has hunger not disappeared? Have we not done enough, or have we done the wrong thing?

First, we have to remember that some successes have been achieved in the fight against hunger.

- Only twenty years ago, some 30 percent of the people in developing countries were undernourished. Today, the figure has fallen to 18 percent.
- In the last fifty years, the production of foodstuffs has tripled.
- Thanks to enormous economic growth, poverty and malnutrition in Southeast Asia have been successfully combated.
- In individual countries such as Ghana and Nigeria, there has been a clear drop in malnutrition and poverty.
- There is a large number of self-help projects run by private and nongovernmental organizations. Let me give you a few examples:
  - the improvement of water supplies in the Kilimanjaro region of Kenya,
  - microloan programs in Bangladesh,
  - the protection of unique natural resources in the north of Malawi,
  - the promoter model operated by Land North Rhine/Westphalia to support the education and information work of the One World groups here in Germany. This initiative is just one of many taken by nongovernmental organizations to whom I extend my warm thanks for their commitment.

But all these efforts are obviously not enough. And this raises the second question: is the problem solvable? Can we achieve the ambitious goal set by the World Food Summit in 1996, that is, to halve the number of those going hungry by 2015?

To my mind, we can still give a positive answer to this question, but we need to make immense efforts if we are to do so. According to our Federal Ministry for Economic Cooperation and Development, we would have to double the production of foodstuffs over the next twenty-five years to achieve this goal.

Much will depend on whether we manage to further increase agricultural productivity. I am aware of the United Nations (UN) recommendation to use biotechnology as an instrument and a tool to this end. But I also know that these methods are controversial. The debate amongst experts and politicians on the effects of large-scale cultivation of genetically modified seeds and plants is still underway.

It will be important to advise and support the 400 million small-scale farmers because the success of our efforts will ultimately depend on their work on the ground. We also need to curb excessive population growth as this is the only way to put an end to growing environmental degradation and the scarcity of foodstuffs.

But even more crucial is our readiness to change our trade regulations. First and foremost that means we have to further open up our markets. We also need to make more resources available for development cooperation.

I am delighted about the Everything but Arms initiative pioneered by the European Union. It will exempt 900 agricultural products from the least-developed countries (LDCs) from import duties.

I am much encouraged by the decision taken by the G-7/G-8 at their recent meeting in Genoa and during the Fourth World Trade Organization (WTO) Ministerial Conference in Qatar. They want to work to ensure the needs of developing countries are given due respect, that is, more respect than to date. Most importantly, markets are to be further opened up for products from developing countries. Progress on realizing the Köln Debt Initiative is certainly also to be seen as a positive sign. To date it has reached a volume of 53 billion US dollars, and 23 highly indebted countries are currently involved.

One part of the globe is a source of concern for us all: Africa. Many have given it up as a lost cause. Although there are more chronically hungry people in Asia, the dimension of hunger is clearly the greatest in the countries of Sub-Saharan Africa. According to the authors of the New African Initiative, Africa is one of the most richly endowed regions of the world yet remains the poorest continent. In Africa, 340 million people live in extreme poverty. These 340 million people have to live on less than one dollar per person per day. There is no progress to record. The situation has either deteriorated further or is stagnant. Here the total number of hungry people and the proportion of the population they represent have grown. Africa is also the region with the lowest crop yields.

As we all know, and indeed you know better than me, hunger has many causes. War and ethnic conflict are certainly the most acute. Africa was and is the scene of many military conflicts, millions have lost their lives as a result and many more have been and are being robbed of their livelihoods. For many years, so-called proxy wars raged there as an ancillary of the East-West conflict. The West is not free from blame. All in the name of supposed stability, it supported for decades a dictator in Zaire who plundered one of the richest countries in a manner almost unheard of in the history of mankind. But I also want to point to the irresponsible policy in a country in southern Africa today which wastes good opportunities to stabilize the population's food supply.

And what is more, until recently, Africa seemed like the forgotten continent. Happily this has changed. Here I am thinking of the G-7/G-8 Genoa Plan, and even more so of the New African Initiative that I just mentioned. The New African Initiative is based on the ideas of the presidents of South Africa, Algeria, Nigeria, and Senegal, thus embracing the English-speaking as well as Arabic and Francophone regions of Africa. As President Mbeki outlined during our talks in June 2001, he considers domestic reform towards democracy and the rule of law as a prerequisite for a successful development policy in the broadest sense. The creators of the Initiative want to strengthen regional integration and cooperation. To my mind, this is a promising approach. Hunger and poverty are also—and sometimes primarily—political problems that have to be tackled with political means. Thus I find it right that the G-7/G-8 declared their readiness in Genoa to cooperate with the countries of this Initiative in a spirit of partnership, and that they support these countries.

Human rights and environmental protection now have worldwide lobbies, but the fight against poverty and hunger does not.

Prime Minister Apolo Nsibambi of the Republic of Uganda offers remarks on behalf of President Yoweri Museveni.

As you see, there are indeed positive developments at the international level. I would be delighted if there were more movement also in Germany. Unfortunately we have now for decades failed to come closer to the internationally agreed goal of industrialized countries pledging 0.7 percent of their gross national products (GNP) to development assistance. That is not a good reflection on us. I believe we have to move towards this goal as a matter of urgency.

We have seen progress in recent years on the fight against the violation of human rights. We have seen progress on environmental protection. This progress has been possible not least because these questions have now been firmly anchored in national and international awareness. The fact that crimes against humanity are now being prosecuted is also a result of the pressure exerted by the international public. Human rights and environmental protection now have worldwide lobbies, but the fight against poverty and hunger does not. People have to be made much more aware that global poverty and global hunger are a scandal that we cannot tolerate.

In the Preamble of the Universal Declaration of Human Rights we read, and I quote, that "the inherent dignity… of all members of the human family is the foundation of … peace in the world." A person who is hungry suffers a violation of his or her dignity. And to change this, the fight against hunger and poverty has to be put at the very top of the political agenda all across the world.

I hope your Conference here in Bonn can provide important momentum to that end. You ought to achieve more than the mere consumption of wood, water, and ink to print yet another conference document. Important as this is, it is not our ultimate aim and object. I wish you a good and successful Conference.

H.E. Apolo Nsibambi

Prime Minister, Republic of Uganda

(on behalf of H.E. Yoweri Museveni, President, Republic of Uganda, and Chair of the 2020 Vision Initiative's International Advisory Committee)

I bring warm greetings from President Yoweri Museveni of Uganda, who is also the Chairman of the International Advisory Committee of IFPRI's 2020 Vision Initiative. Because of heavy national and international duties, he was unable to attend this Conference and asked me to represent him.

Food security means access to adequate amounts of nutritious food for all people at all times. The 2020 Vision Initiative has urgently pushed for sustainable food security for all by the year 2020. I am saddened to point out that 800 million people are food insecure. Why are we failing to realize sustainable increased food production and distribution? Many developing countries lack a deliberate food policy. It is important for developing countries to accept our internal weaknesses before we blame external factors. Accordingly, I have initially focused on the internal weaknesses of developing countries, which must be addressed. In our view, a country that possesses a deliberate food policy must do the following:

- Know the quantity of food required to feed its people and the necessary nutritional value;
- Allocate to its Ministry of Agriculture a fair share of the recurrent and the development budget (not less than 5 percent of the total budget);
- Invest in water for production so that it is not dependent on rainfed agriculture, which cannot stand the shock of drought;
- Invest in market development and promotion;
- Have an effective market-oriented system;
- Carry out land reform that grapples with the inaccessibility of people to land, insecurity of tenure, and other problems that hinder food production;
- Invest in postharvest systems handling agricultural production; and
- Invest in an effective communications system.

Unfortunately, many developing countries lack a deliberate food policy. Worse still, developed countries that produce surplus food readily supply their surplus food to these countries. As a result, many developing countries do not feel enough pressure to adopt deliberate food policies. The food-deficit countries tend to ignore the fact that it is impossible to pursue independent food policies when they depend on food aid from developed countries.

It is important for developing countries to accept our internal weaknesses before we blame external factors.

But critical inhibitors of increasing food production in developing countries are also attributable to negative external factors. For example, developed countries give high subsidies to their literate farmers, whereas the illiterate farmers of developing countries are denied similar subsidies. Thus the playing field is not level. We realize that there are significant political pressures from farmers in developed countries to maintain subsidies. However, if there is political will and proper explanation to farmers in the developed countries, the subsidies can be phased out. This Conference should come out with a timetable for tackling this problem.

Another problem is that developed countries with surplus food tend to dump it into developing countries through export-subsidy arrangements. Consequently, developing countries lose the capacity to sell their produce locally and in the international market. This practice in turn destroys the incentive of our farmers to produce more food.

Technological development and transfer is yet another issue that must be rigorously addressed. To increase production, developing countries must encourage their farmers to use improved seeds and stock in order to realize increases in food production. Animal traction, appropriate tractor and solar energy, and rural electrification are important tools for increasing food production on a sustainable basis.

However, for farmers to embrace improved technology, they need guaranteed internal and external markets. In this light we welcome the African Growth and Opportunity Act (AGOA) and the recent move by the European Union (EU) to open up its markets to selected agricultural products from developing countries. These include apples, bananas, pineapples, and fish. The challenge to the developing countries is to produce quality products in enough quantity.

The issues of farmers' access to credit and the impact of globalization on trade must be expeditiously addressed if we are to increase food production on a sustainable basis. Microfinancing is necessary to enable farmers to acquire the new technologies for increasing food production. With regard to globalization, it is important that rules governing world trade be reviewed. For example, currently, the tariff and nontariff rates of the WTO favor developed countries.

The scourge of HIV/AIDS has crippled the health of the labor force globally. President Museveni was able to define the nature and the range of the problem of HIV/AIDS correctly and to take deliberate policy steps. As a result, Uganda has been able to reduce the HIV/AIDS scourge from 35 percent in 1986 to less than 6 percent today. We must tackle this disease globally by making drugs affordable and by adopting other practical measures.

An illiterate population tends to be highly localized and finds it difficult to respond to the challenges of modernizing agriculture. Uganda introduced Universal Primary Education, a measure that is enabling us to give relevant skills to the population that has to grapple with the problems of modernizing agriculture.

We have to invest heavily in conflict prevention and management so that our effort and finances may not be squandered in fighting secondary and stupid wars. We must work together to promote good governance. All these measures would enable us to create a propitious environment for producing adequate food in a sustainable manner.

In conclusion, the achievement of sustainable food security for all by the year 2020 requires radical internal and external reforms and leaders who possess political will to implement our cherished vision. This challenge applies to the developing and developed countries. It is my sincere hope that this Conference will come out with clear recommendations and practical strategies that will enable us to achieve sustainable food security for all.

Heidemarie Wieczorek-Zeul

Federal Minister for Economic Cooperation and Development, Federal Republic of Germany

Globalization and international connectedness offer many opportunities, but they also frighten many people. People are frightened of something overpowering, something that has them at its mercy—for instance, a world order that is dominated by the economically powerful and no longer has room for the weak. This was the concern being voiced by the peaceful protesters in Genoa and at previous summits and conferences. We should take their questions and their criticism seriously, because they are right in saying that the processes associated with globalization are not subject to adequate democratic control. Moreover, because of their particular economic, political, and social conditions, different regions and countries benefit from these processes to varying degrees.

Food provides a good example: the range of foods consumed by people in the North has broadened considerably, and most any culinary treat from faraway lands and oceans can be bought in the shops here in Bonn. At the same time, 24,000 people worldwide are dying each day from the consequences of hunger, and 18,000 of them are children. And this goes on even though enough food is produced worldwide to feed all people. We need to realize that economic globalization does not automatically amount to globalized food security—800 million people continue to suffer from hunger.

It is high time that we tackled the present social inequities and unequal opportunities. We need to reform and further develop the existing approaches to global governance. In that effort, we need to set clear goals for ourselves and enforce them—even if that compromises vested interests, particularly the interests of the rich countries. At the 1996 World Food Summit, the international community set itself the target of halving the number of undernourished people by no later than 2015. To meet that goal, all players need to shoulder their share of the responsibility:

- The industrialized nations need to reduce their agricultural protectionism and open their markets. With the Everything but Arms initiative, the EU has taken an important step toward allowing the least-developed countries tariff-free access to EU markets. The other industrialized nations now need to do

An illiterate population tends to be highly localized and finds it difficult to respond to the challenges of modernizing agriculture.

likewise, and the initiative needs to be expanded. After all, the developing countries lose out on income of around $40 billion each year because of the agricultural protectionism of the rich countries.

- The governments of the developing countries, in turn, need to launch the required agrarian and land reforms and invest in rural institutions and in education and health. The donor community needs to support them in that effort.

Today's Conference builds on an IFPRI conference that took place six years ago. The motivation for holding this follow-up Conference was rooted in new developments, for instance in the area of biotechnology. The United Nations Development Programme's (UNDP's) recent *Human Development Report* accords a positive role to biotechnology and genetic engineering in solving the problem of hunger. The report has met with a mixed response. I agree with the many experts who say that genetic engineering cannot completely eradicate hunger in developing countries. But the technology does offer opportunities that we should use together with the developing countries.

According to the UNDP report, however, the top priority is appropriate risk management, to identify and quantify existing risks—and I quite agree. We are continuing to work on international negotiating bodies to ensure that developing countries will not be disadvantaged as a result of the rights protecting biotechnology inventions. To put it plainly, the regulations in the Trade-related Aspects of Intellectual Property Rights agreement (TRIPS) must not deny developing countries their right to design their own national legislation, within the framework of laws in force, such that, for example, seed obtained can be resown or used for local research. The industrialized countries must recognize the sovereignty of all other countries over their traditional knowledge and their crop genetic resources.

The industrialized nations need to reduce their agricultural protectionism and open their markets.

Let me emphasize the close links that exist between hunger and food security on the one hand and a large number of issues of global relevance on the other. The importance of finding joint solutions cannot be overstated.

Sadly, the figures on world hunger can be topped by some even worse statistics: 1.2 billion people live in extreme poverty worldwide, with 900 million of them living in rural areas. In most countries of Sub-Saharan Africa, the agricultural sector is the main pillar of rural people's livelihoods, the main consumer of the ecologically sensitive resource base, and the decisive force behind economic development. Given continuing population growth, the first step toward effectively improving people's income and food situation in these countries is to bring about a sustained increase in agricultural productivity. Food security and improved access to productive resources for the rural poor are fundamental prerequisites for sustained poverty reduction—but to be successful, agrarian reforms need to be in place.

The German government took account of the close link between hunger and poverty in its Program of Action 2015. The Program of Action describes the contribution made by the entire German government toward halving extreme poverty worldwide. For the first time in German history, the fight against global poverty has been put on the agenda of the entire government. This is an important step toward meeting our international responsibility and realizing all people's right to food.

The Program of Action is the first such program to translate the words of the Millennium Summit into deeds. We wish to ensure that Germany will not be alone in that effort, so we are inviting other countries to join in by developing programs of their own. After all, the Millennium Summit conceived poverty reduction as a major orchestral work, not a solo piece. All players—that is, the governments of industrialized and developing countries, international organizations, and civil society—need to identify and implement their

specific contribution to move closer toward the ambitious goal of halving poverty.

When talking about poverty, we inevitably speak about agricultural production and resource use. Take water, for example: two-thirds of the scarce water resources available are currently used by agriculture. Forty percent of all food, especially wheat and rice, is produced on irrigated fields. Yet, FAO has shown that only some 45 percent of the water used in irrigation actually reaches the plants. That implies an urgent need for more efficient irrigation methods and strategies to ensure that water requirements for drinking and food production can continue to be met. Although this task will receive broad attention at the water conference to be held in Bonn in December, it merits thorough discussion here as well.

The industrialized countries must recognize the sovereignty of all other countries over their traditional knowledge and their crop genetic resources.

Without water there can be no life. The same goes for climate protection, a topic that is given far more attention in the North—the main culprit of climate change. In the developed countries climate change is usually considered in the context of industrial production patterns. However, rural production is also closely linked to climate change. It is estimated that, by 2100, agriculture will have seen a considerable decline in yields and production due to climate change. A few figures demonstrate the potentially disastrous implications of the problem. According to the same estimate, corn yields in Gambia will drop by as much as 26 percent, and wheat yields in Bangladesh by 61 percent. African countries in particular will be affected by the impact of climate change on agriculture. Falling yields and rising prices could result in an additional 70 million hungry people! This presents an enormous challenge for scientists, policymakers, and the business sector: to prepare agricultural production for this situation and to adapt food crops to the changing conditions. We need to support the developing countries in that effort.

A worldwide effort is also needed to fight the three major infectious diseases: malaria, tuberculosis, and HIV/AIDS. These diseases together form the greatest health threat in developing countries. That is why a commitment was made at the G-8 Summit in Genoa to provide funding to establish a Global Health Fund. The three diseases have serious consequences for food security. In the case of AIDS, more than 36.1 million people have been infected, 95 percent of whom live in developing countries. According to FAO estimates, since 1985 AIDS has killed 7 million people working in agriculture in the 25 hardest hit African countries. Another 20 million could be added to the toll within the next 20 years. AIDS thus has a major impact on food production and threatens the life of rural communities. It is not just a disaster for the people who are infected but undermines the food security of the entire population and thus the development of the countries concerned.

Studies have established a clear link between people's economic and social productivity and their health and food status. The foundation is laid when children are quite young. Food in sufficient quantities and of sufficient quality is a cornerstone in the development of any country. Our actions must take account of the significant role of food.

The role of food becomes even more obvious if we look at the connection between political and social crises and national food situations. The 10 countries with the worst food situation have all undergone violent conflict or natural disasters. Between 1970 and 1990, violent conflict led to hunger and reduced food production and economic growth in 43 developing countries.

If crises result in hunger and a decline in agricultural production, the reverse is also true: hunger and unsatisfied basic needs are often at the root of conflicts. Once politically dominant groups take possession of land and food supplies and bar minorities access to these resources, violence becomes virtually inevitable. However, we have learned from Amartya Sen that countries with democratic structures and a certain measure of freedom of the press have largely succeeded in averting hunger and suffering. That is what our efforts must focus on. We need to break the vicious cycle of hunger and war and focus on prevention. This is where the governments of the developing countries have a special duty to act. However, they can count on the support of the donor countries in performing that duty.

These problems—poverty, climate change, AIDS—show that food security for all is a global challenge. Along with food security, these problems were also discussed at the G-8 meeting in Genoa. Now we need to make sure that they do not just enter the communiqués of a small number of countries but are adopted by the entire international community. I therefore appeal to those responsible to include the topic of world food on the agenda of the Rio+10 Summit in 2002.

The true test will be how we actually implement our programs. This Conference can play a major part. We can combine our knowledge and experience of food security, bring it up to date, and strengthen all players' political commitment to fighting hunger. Each and every participant should leave knowing what steps to take next. In this way we can lay the foundation for the World Food Summit and Rio+10. We owe the critical voices that will be accompanying these summits in Rome and Johannesburg an answer—here, we can collectively devise such an answer. Only decisive policies, joint efforts on the part of all governments, and the participation of the private sector and civil society will enable us to meet the challenges being addressed at today's meeting. A world that has been rid of the scourge of poverty and hunger, a world in which all people have an opportunity to develop their potential—that should be the shared vision of a global alliance for reform.

We need to break the vicious cycle of hunger and war and focus on prevention.

Bärbel Dieckmann

Lady Mayor of Bonn, Germany

A few weeks ago the second session of the 6th Conference of the Parties to the UN Framework Convention on Climate Change was held here in Bonn. I now have the pleasure of being able to join in opening another conference—a conference that tackles one of the most important questions affecting the future of humankind. So I welcome you all most warmly to Bonn. I am especially pleased that the President of the Federal Republic of Germany is here with us. His presence here emphasizes the great importance the Federal Republic of Germany attaches to this task.

The Conference is taking place in the Plenary Chamber of the former German Bundestag building—where the parliament of the Federal Republic of Germany met and worked for many years. This is where the new UN center will be set up. With 400 UN staff members, Bonn still ranks as a small UN city. However, it is growing all the time. Bonn is also an international city: 48 embassies, 39 foreign missions, and 6 consulates general are currently located here, and 1 in 7 of the city's inhabitants carries a foreign passport. This conference is one of a series of important events that have been held or will be held here in Bonn. Other examples I would like to mention in this context are the Conference on Biological Diversity in October and the International Conference on Freshwater in December.

Since 1991 Berlin has been the German federal capital. And as the capital, Berlin is the main stage for German politics. Over the last few years, however, the city of Bonn has developed into a

place of global dialogue, a center of international cooperation. Here in this city, the issues that determine our future are discussed and decided. Many partners contribute to this process, including the six German ministries that have remained in Bonn; the UN organizations located here; the German development agencies—first and foremost the German Foundation for International Development (DSE), which is one of the organizers of this Conference; a series of nongovernmental organizations; scientific organizations; and the media, to mention only a few. In addition, Germany's international broadcaster, Deutsche Welle, will also soon be relocating to Bonn.

Bonn is also a city of science and research, and enjoys an excellent national and international reputation as a location of special importance for the agricultural sector. The relocation to Bonn of the general secretariat of the CIGR (International Commission of Agricultural Engineering) provides clear evidence of its significance. The University of Bonn has become one of the top addresses in agricultural technology.

Finally, I wish you a rewarding and successful conference here in Bonn, and extend once more a cordial welcome to you in the UN city on the Rhine.

Imagine what we can do together if we make sustainable food security for all our top priority and pull in the same direction.

Per Pinstrup-Andersen

Director General, International Food Policy Research Institute

It gives me great pleasure to join in welcoming you to this IFPRI Conference on "Sustainable Food Security for All by 2020." I am delighted that we have individuals from so many stakeholder groups dedicated to creating an environment in which people can escape food insecurity and malnutrition in a manner compatible with sustainable management of natural resources. Imagine what we can do together if we make sustainable food security for all our top priority and pull in the same direction. We can make a difference in the lives of millions.

Much progress has been made during the last 30 years, but much more needs to be done. Despite rapid economic growth in many developing countries, per capita incomes in one-third of all developing countries are lower today than 20 years ago, and life expectancy in one-fourth of the developing countries is lower today than 20 years ago.

Millions of children die every year from nutrition-related illnesses, and many more millions do not develop to their full potential because they are malnourished. About 800 million people are food insecure, meaning that they either starve or they do not know from where their next meal will come. Much of the progress on food security has occurred at the expense of our environment. With business as usual, IFPRI projects that the nutritional improvements during the next 20 years will be less than the improvements made during the last 20 years and environmental degradation will continue.

In a world as rich as ours, such a situation is a disgrace, it is ethically and morally wrong, and it is bad economics. Eliminating human misery and the associated wastes in a sustainable manner would benefit us all. And we owe it to our fellow men and women and to future generations.

Solutions to the food and nutrition problems need to be designed and implemented within a new and rapidly changing environment. Globalization and sweeping technological changes offer new opportunities for solving these problems. But changes in policies and institutions are needed to

Per Pinstrup-Andersen, Director General of IFPRI, Johannes Rau, President of the Federal Republic of Germany, and Heidemarie Wieczorek-Zeul, Germany's Federal Minister for Economic Cooperation and Development, listen to the opening remarks.

turn these opportunities into benefits for the poor and malnourished. Without a new policy agenda, globalization and new technology may bypass the poor or actually do them harm.

A number of other driving forces or trends must be taken into account in developing appropriate action. If recent trends continue, water scarcity will become the biggest barrier to achieving sustainable food security in an increasing number of areas. Soil degradation is widespread, and yields are negatively affected in many localities because farmers are removing more nutrients than they are putting back into the soil. Climate change is posing new problems for agricultural researchers and farmers. Emerging and reemerging health problems (such as HIV/AIDS, tuberculosis, and malaria) are not only killing more people and creating more human misery, they make it virtually impossible for millions of people to escape poverty and food insecurity. Rapid urbanization in developing countries is gradually moving people and poverty from rural to urban areas.

Some of the action needed, such as primary health care and appropriate technology for small farms, is not new, but it must be cast in the new and changing global and national environment, taking into account new opportunities and risks. Promotion of pro-poor growth, empowerment of the poor, and effective provision of public goods are the backbones of a successful approach to achieving sustainable food security for all. I hope that by providing a forum for knowledge exchange, this Conference will help identify the action to be taken.

Who is responsible for taking action? Dramatic changes in the roles of national governments, civil society, the private sector, and international institutions are creating confusion about who is responsible. Some use these changes as an excuse for not taking action. Hopefully, this Conference will help reduce the confusion, eliminate the excuse, and break the complacency.

Constructive dialogue across and within the various interest and stakeholder groups, including the intended beneficiaries, is critical to finding the best solutions. We must turn shouting into constructive dialogue and dialogue into action.

In conclusion, even if those responsible give high priority to achieving sustainable food security for all and back it up with action, the world may not achieve the goal by 2020. But we will be much closer than with business as usual. All of us should provide the strongest support for the World Food Summit goal of reducing food insecurity and malnutrition by half by 2015. The progress by most countries during the five years since the summit has been mediocre. We must support FAO's efforts to once again draw attention to this goal at the upcoming World Food Summit: five years later.

Unless the solutions to food and nutrition problems are given a much higher priority by governments everywhere, the human misery and economic waste embodied in food insecurity and malnutrition will continue at high levels. How do we explain that to the millions of mothers and fathers who are fighting to give themselves and their

Over 900 participants from 71 countries attended the Conference in the International Congress Centre of the Federal Parliament in Bonn, Germany.

Chapter 2

Food Security in a New Context: The Need for This Conference

Rajul Pandya-Lorch
Head of the 2020 Vision for Food, Agriculture, and the Environment Initiative, International Food Policy Research Institute

When we first began planning this Conference, we hoped about 300–400 people would be interested in participating. Never did we imagine the level of interest the Conference would generate! I am humbled and awed by the energies coming together in this room. Imagine what we can do together to end hunger as we know it.

Let me remind you of what we are trying to accomplish. Our ultimate objective is to influence and catalyze action to achieve sustainable food security for all by 2020. We hope to break the malaise that is causing woefully slow progress in tackling hunger and malnutrition.

This Conference builds on an earlier IFPRI 2020 Conference held in June 1995 in Washington, D.C. At that Conference, a global vision was articulated and priorities for an action plan were identified. However, progress in tackling hunger and malnutrition has been marginal at best and certainly far less than hoped for. Moreover, there have been a number of emerging or intensifying developments with extraordinary implications—sometimes positive, sometimes negative, and sometimes unknown—for global food security. These emerging or intensifying developments include sweeping technological changes, the accelerated pace of globalization, the explosion or reemergence of health and nutrition crises, and the emergence of major new actors accompanied by the sidelining of traditional actors in the food security arena. These are compelling reasons to share new information and new ideas on the driving forces shaping global food security, to revisit the priorities for action at the global level and assess whether they need to be changed, and to bring together key actors and key perspectives to improve our understanding of roles and responsibilities.

This Conference is not an intergovernmental conference like those held by the United Nations where binding or nonbinding resolutions are sought. We will engage to inform and educate each other, exchange ideas in dialogue and debate, and energize ourselves to translate the dialogue into action following the Conference.

The Conference program comprises three parts. The first addresses where we have come from, why progress in reducing food security is slow, and where we could be headed. The second part focuses on the emerging or driving forces shaping the prospects for food security in coming decades. Of course, these

are not the only driving forces influencing food security, but these are the forces that appear to have the largest impact on food security at the global level or for the largest number of countries. They are clustered into four sets: demographic, health, and nutrition forces; economic forces; technological and environmental forces; and sociopolitical forces. The third part of the Conference focuses on the priorities for action and on roles and responsibilities for ending hunger—in other words, what absolutely needs to be done and by whom.

…there have been a number of emerging or intensifying developments with extraordinary implications—sometimes positive, sometimes negative, and sometimes unknown—for global food security.

We have drafted a Vision document identifying the priority actions required to achieve the 2020 Vision of a food-secure world for all. This document does not pretend to be an all-inclusive action plan—that is not our intent. Our intent is to suggest the key priorities for action at the global level. You may already be familiar with some of what is in the document: some fundamentals simply need to be in place without which sustainable food security will remain elusive. We welcome comments on this draft. If you feel that there are items that are simply not a global priority, let us know. And if you feel that there are actions that should be priorities but are missing from the document, again let us know. Let me assure you that there is no desire on our part to arrive at a document to be collectively signed or authored by all those who participate in the Conference. This is an IFPRI document and we will not hold anyone but ourselves responsible for the views that are articulated in it.

The issues we are tackling in this Conference are complex. We recognize that there is simply no way to deal with all of these issues in three days if we are not disciplined. We have asked speakers to be very brief in their presentations, in most cases no more than 10 minutes each. I know that the speakers will rise to the challenge of being informative, provocative, and stimulating in the time allotted to them.

Let me thank all of you for dedicating your time and energy to participate in this Conference. We hope that you will find it so enriching that you will leave here energized to take action and to influence others to take action to realize the 2020 Vision of sustainable food security for all.

Part 2

Food Insecurity

Why Haven't We Solved the Problem?

Chapter 3

How Committed Are We to Ending Hunger?

Chair: Piet Bukman

President of EuronAid and former Minister of Development and former Speaker of the Parliament in the Netherlands

The first part of the working session of this Conference is dedicated to taking an in-depth look at the complex issues and framework conditions needed to reduce and, if possible, eradicate hunger, one of the most striking expressions of poverty.

As president of EuronAid, a network of European nongovernmental organizations (NGOs) implementing food aid and food security programs worldwide, I can say that we are strong advocates of results-oriented discussions and actions. For us the emphasis lies on what will be the practical outcome of a thousand-expert meeting here in Bonn for the poor and hungry people in India, Afghanistan, Haiti, Ethiopia, the Sudan, and, unfortunately, on and on.

The political, economic, scientific, and biological environment within which we commit ourselves to end hunger is very, very important. But let us try not to work with our heads in the clouds as that may prevent us from seeing the realities at the grassroots level. Let us try to avoid too high a level of abstraction. Everybody is against hunger. That is the highest level of abstraction, but it doesn't help us. Let us try to remain, as much as possible, at the grassroots level.

That a representative of an NGO network is chairing this part of the session can be seen as recognition of the commitment of our NGO members and their supporting partners and counterparts. In our view, civil society has to play an active role in campaigning against hunger and poverty. Fortunately it does, in the South as well as in the North. NGOs fulfill a very important role.

Our discussions should not be guided by either ideological considerations or populist views. On the contrary, to reach an effective outcome, we should adopt the perspective of the 800 million people in the world who do not know where their next meal is coming from.

The question "How committed are we to ending hunger?" is a practical, relevant, and urgent one. It should be higher on the list of political priorities.

Keynote: Sartaj Aziz

Senator and former Agricultural Minister, Finance Minister, and Foreign Minister, Pakistan

Twenty-seven years ago—at the 1974 World Food Conference in Rome—world leaders accepted for the first time the common responsibility of the international community to abolish hunger and malnutrition within a decade.

The concerns generated by the food crisis of the mid-1970s and the concrete program of action outlined by the World Food Conference persuaded most developing countries to reorder their priorities, increase investment in agriculture, and readjust their macro policies in favor of agriculture. The results achieved in the next two decades were quite encouraging. The world production of cereals grew at 3.8 percent per year, outstripping the annual growth in demand of 3.3 percent. The daily per capita dietary energy in developing countries rose from 2,140

calories in 1970 to 2,716 in 1996–98, and the number of malnourished people declined from about 1 billion in 1970 to 800 million in 1996–98. As a percentage of total population, the decline was even faster, from 37 to 18 percent.

But these averages conceal some depressing realities that represent the negative side of the food security balance sheet:

- At least one-fifth of the total world population —or 1.2 billion people—is still very poor and subsists on less than one dollar a day. Of this group, an estimated 800 million are undernourished. These people are chronically poor and will not be able to achieve food security even if the average availability of food goes up.
- The food security situation in the 48 LDCs is much worse than that in the rest of the developing world. The per capita food consumption index in these countries between 1980 and 1998 has, in fact, declined to 94, while for developing countries as a whole it has improved to 140. As a result, the number of undernourished people in the LDCs has doubled, from 120 million to 240 million or 40 percent of their total population.
- The debt burden of developing countries has reached crisis proportions and is now crippling their efforts to accelerate growth or reduce poverty.
- The dependence of developing countries on food imports has grown enormously in the past 25 years, without a corresponding improvement in their import capacity. The total food imports of developing countries in 2000 amounted to $60 billion, including $25 billion for low-income, food-deficit countries.

A determined attack on poverty and hunger will require the formulation of a new development paradigm that recognizes the role of the state in protecting the rights of the weaker and poorer segments of the population and in meeting their basic needs.

According to more recent trends, the prospects of reducing by half the proportion of poor and undernourished people by 2015 do not appear promising. First, the chronic nature of poverty that afflicts the bottom one-fourth of the population in developing countries cannot be alleviated unless a new development framework evolves. Second, agricultural growth in the developing countries in the coming decade is likely to be slower than the impressive growth achieved in the past two decades. And third, the capacity of developing countries to import food is hampered by growing competition in world markets in the wake of globalization. These factors constitute the three main dimensions of the emerging food security situation that require urgent and effective actions at the national and international levels.

The world showed remarkable creativity in the 1970s in learning from the lessons of the preceding two decades—a time during which the impressive economic progress in many developing countries had not provided tangible benefits to the bottom 40 percent of their population. The development community and the UN system as a whole began to construct an alternative development strategy, focused on objectives like employment, basic needs of the population, poverty reduction, and income redistribution policies. But before these new concepts could be translated into actual policies and national priorities, a serious debt crisis struck several Latin American countries in the early 1980s. In the wake of that crisis, the World Bank and International Monetary Fund (IMF) took

over from the rest of the UN system the task of designing reforms that would enable the developing world to handle its debt crisis.

The promising ideas of the 1970s, like full employment, food security, small-farmer agriculture, income distribution, education, housing, and drinking water, were relegated in priority, and liberalization and privatization were presented as the panacea for all economic ills. The role of the state was condemned as the source of all problems and the market as the main instrument for reviving growth, which, if sustained, would take care of all social problems. The age of globalization had arrived.

Within the developing countries, the inherent social handicaps of the poor were already quite formidable. But these handicaps have been further compounded by the globalization policies introduced in many developing countries in the past two decades. Even where these policies helped improve investment and growth, they were not very successful in reducing poverty. This resulted largely because reductions in subsidies raised food prices, fiscal restructuring increased unemployment, and the all-around shrinkage of state activity reduced social services like education, health, and housing for low-income groups. That is why one-fifth of the world population is still very poor and 800 million people are still chronically malnourished.

The task of balancing the required adjustment policies for macroeconomic stability with policies that promote pro-poor growth and sustain social development is perhaps the greatest challenge facing policymakers in the developing world today.

A determined attack on poverty and hunger will require the formulation of a new development paradigm that recognizes the role of the state in protecting the rights of the weaker and poorer segments of the population and in meeting their basic needs. In articulating this new paradigm, we have to recognize that

- Balanced social development is a basic and essential prerequisite for sustainable development, and social problems are not simply "inevitable costs" of structural adjustment;
- Sustainable development does not mean "development with environment" but a pattern of development that is meaningful for the large majority of the population;
- Social development cannot be financed merely from residual financial resources that the adjustment process may spare, and the standardized "one size fits all" policies advocated by the IMF, which restrict demand and thereby increase poverty and unemployment, must be modified either by providing a longer time frame or additional external resources on soft terms; and
- Market-oriented economic policies are necessary for economic growth, attracting investment, and improving competitiveness in international markets, but the pace of liberalization should not move faster than a country's institutional structure can cope with. Before large-scale liberalization is undertaken, effective regulatory mechanisms must be created to deal with the growing volatility of the capital and foreign exchange markets.

Once these conceptual barriers have been crossed, the prospects of implementing the more traditional prescriptions for agricultural development and poverty reduction will improve enormously. These include assigning higher priority to small-farmer agriculture, favoring macroeconomic policies that improve the terms of trade for agriculture, building participatory institutions for credit marketing and research, and promoting opportunities for nonfarm employment activities on a large scale. In the existing policy framework—as, for example, spelled out in several national poverty

reduction strategies under the auspices of the World Bank and IMF—there is no fiscal space for actually implementing such pro- agriculture and pro-poor policies. The task of balancing the required adjustment policies for macroeconomic stability with policies that promote pro-poor growth and sustain social development is perhaps the greatest challenge facing policymakers in the developing world today.

It is a great irony of history that in tackling the second-most important unfinished task of the twentieth century, namely eradicating poverty (the first being establishing durable peace), the developing countries face a very unfavorable global environment. This should be clear from the following distortions and inequities:

- The global trading and financial system works against the long-term interest of low-income countries and poor people and does not provide a level playing field or a truly competitive environment. The WTO policy of liberalizing trade concentrates on high-tech products largely of interest to developed countries, a few middle-income developing countries, and multinational companies. Simple manufactures like textiles and leather goods, which are of greater interest to low-income developing countries, are still subject to quotas and protectionist policies. Movement of labor, which is an important factor in the production cycle, is also seriously restricted.
- The developed countries are providing their agriculture sectors with subsidies totaling $350 billion a year, which is almost six times the total official development assistance (ODA) provided to developing countries. The developing countries and particularly the 48 LDCs, which primarily depend on agricultural exports, cannot compete in the international market with subsidized agricultural exports from the developed countries. This has not only reduced the share of developing countries in global agricultural trade but has also weakened the incentive system for increasing domestic production.
- The world monetary system creates excess liquidity every year by transferring purchasing power to the richest country in the world. All attempts to create a global system of liquidity creation, for example through the IMF special drawing rights (SDR), which could distribute the resultant purchasing power more equitably, have been turned down. Now, belatedly, Europe is trying to secure a share in this liquidity through use of the euro as a reserve currency, but it is facing serious difficulties.
- The level of ODA, which was intended partly to compensate for the inequities of the global system, has been declining even in absolute terms to less than 0.2 percent of GNP, instead of moving toward the internationally accepted target of 0.7 percent of GNP of donor countries. Total ODA has declined from $87 billion to $61 billion in the past 10 years. Sadly, the ODA flowing to the 48 LDCs has also declined from $18 billion to $14 billion during this period. If, by some miracle, the entire $61 billion could directly reach the 1.2 billion very poor people, it would mean an addition of only $50 per year to their incomes or the paltry sum of $4 per month. In practice, of course, less than 10 percent of ODA actually reaches the poor, with very limited impact on their lives.

While world leaders are slowly beginning to realize the full implications of these inequities in the global system and to grapple with the political dimensions of globalization, civil society in Europe and America has been shocked into action. The past two years have witnessed an unprecedented public uproar about the impact of globalization on the poor. Ever since the fateful WTO meeting in Seattle in November 1999, the size and intensity of public protests have grown at each international meeting, in Washington, D.C., Bangkok, Prague, Davos, Quebec City, and, more recently, Genoa. The media show thousands of young people, mostly from

western countries, protesting at each of these meetings. But after these meetings, there is very little in-depth discussion of the issues the protestors have been raising or effort to fully grasp the grave realities in the developing world.

The basic message that the protestors at all these international meetings have been trying to convey in the past two years is simple. First, the global development crisis that the poor of this world face today cannot be solved in purely market terms. The poor do not have much income, so they cannot enter the market in the first place. Second, if the goods are scarce, the prices will rise, the rich or middlemen will buy, and the poor will starve. Third, if there is a glut, the prices will drop, and the small farmer will be ruined because he or she cannot hold onto his or her produce for very long. Fourth, prices and access to markets are always manipulated by the powerful companies or countries to the disadvantage of poor people and poor countries.

The inherent inadequacies of an unregulated market system are fully understood in the more advanced societies. That is why they have created laws and institutions against monopolies to protect the consumer and the small businesses; they have developed an elaborate system of taxation and social security to protect the weak and assist the poor. But at the global level, they refuse to recognize the impact of unjust or inappropriate globalization policies on the poor and to create similar tax or social security policies.

The objective of ensuring food security for every man, woman, and child has been accepted and endorsed at several international conferences from the 1974 World Food Conference to the 1990 Summit for Children, the 1995 Copenhagen Summit for Social Development, and the 1996 World Food Summit in Rome. The Rome Declaration of the 1996 World Food Summit presented a comprehensive plan of action covering all the important dimensions and principles of food security such as conservation of ecological foundations, investment in agriculture, importance of technologies, political and economic preconditions for eradicating poverty and inequality, and creation of a fair and market-oriented world trading system. Unfortunately, hardly any of these commitments has been implemented in the past five years.

Instead of adopting another declaration with high-sounding aspirations and pious hopes on food security, this Conference, I hope, can lay the foundation for a broad coalition of policymakers, the academic community, and civil society. Our aims should be to launch a global effort to create an alternate but sustainable development strategy and at the same time to propose an agenda for the reform of the global monetary, financial, and trading systems to create a more favorable international environment for sustainable development.

The European Community has taken a leading role in saving the Kyoto Protocol on global warming. Can we expect similar bold leadership from Europe in another area that will affect the future well-being of half of mankind: sustainable development (which is more meaningful for the large majority of people in developing countries) and global policies and programs that will not, at a minimum, discriminate against developing countries? Some of the inequities of the present system can be rectified by imposing, for example, a carbon tax on petroleum consumption or a Tobin Tax on currency movements to generate a regular and autonomous flow of funds for poverty reduction and food security. If full agreement on such proposals is not possible among all the donor countries, some countries or groups of countries can implement them to supplement their ODA allocations.

As the late Barbara Ward said so prophetically 25 years ago, "Unless drastic changes are made in our global system, we are to move into an epoch in which world markets will, even more decisively than in the colonial period, impoverish the already poor and even transfer income from the poor to the

Chapter 4

Successes and Failures in Achieving the Goals of the World Food Summit

Chair: Michael Rewald
Director, Partnership and Household Livelihood Security Unit, CARE

Despite some notable and encouraging success stories, it is unlikely we will meet the goals of the 1996 World Food Summit. Some countries have been able to drastically reduce malnutrition rates while others have had little success. Certain common factors that have had a significant influence on the efforts to reduce malnutrition may explain why we have not met our targets at the macro level.

I would like to briefly explore the issue from the micro level, where NGOs traditionally work. I work with CARE, an international NGO that has programs in more than 60 countries around the world. Quite some time ago, we began asking ourselves whether we were making progress toward reducing hunger and, if not, why not.

This questioning has resulted in changes in the way we carry out our work. One important lesson we have learned is that problems are almost never as simple as they first appear to be, and single-sector, isolated projects rarely achieve long-term sustainable impact. The lives of the poor with whom we work are extremely complex, and unless we do a better job of understanding those complexities and developing appropriate programs that work at a variety of levels, long-term success will be difficult to achieve.

In an effort to improve our contextual analysis and design more holistic programs, CARE has been utilizing the household/livelihood security (HLS) programming framework for the past several years. We define household/livelihood security as adequate and sustainable access to income and resources to meet basic needs. Through the use of the HLS framework, CARE has been able to carry out more holistic analysis, design programs that focus on key leverage points, and develop more coherent information systems for monitoring and evaluation. However, despite seeing significant improvements in the impact of our programs, we now recognize that to bring about lasting change, a whole new approach to poverty is required.

In the past, CARE has viewed development in terms of fulfilling people's basic needs. Recently, CARE has adopted a rights-based approach. And while some people see this merely as a matter of semantics, we feel it will fundamentally change our approach to development.

For CARE, a rights-based approach deliberately and explicitly focuses on people achieving the minimum conditions for living with dignity. It does so by analyzing the root causes of vulnerability and marginalization and addressing those causes through an expanded range of responses. It empowers people to claim and exercise their rights and fulfill their responsibilities. A rights-based approach recognizes that poor people have inherent rights essential to livelihood security, rights that are validated by international standards and laws.

We recognize that using a rights-based approach will require some fundamental changes in the way we do business. These changes include undertaking better sociopolitical analysis, committing to longer-term programs, working more closely with a variety of stakeholders, and increasingly focusing on advocacy in order to address more macrolevel issues.

To sum up, three lessons point to how we can better reach our goals at all levels: take a more holistic, programmatic focus based on sound contextual analysis in a household/livelihood security approach; work more in true partnership with others; and address issues of rights and the underlying causes of poverty.

Keynote: William H. Meyers

Director, Agriculture and Economic Analysis Division, Food and Agriculture Organization of the United Nations

I have been asked to talk about successes and failures in achieving World Food Summit goals. The main goal has already been mentioned a couple of times: reducing the number of undernourished people from 800 million to 400 million by 2015.

At the World Food Summit in Rome in 1996, heads of state representing 186 countries affirmed their "common and national commitment to achieving food security for all" and agreed to work toward achieving the intermediate goal of "reducing the number of undernourished people to half their present number no later than 2015." But recognizing the multifaceted nature of this commitment, the World Food Summit plan of action also contained seven commitments, which, in a broad action area, remain relevant for reducing the number of undernourished and eventually achieving food security for all.

A rights-based approach recognizes that poor people have inherent rights essential to livelihood security, rights that are validated by international standards and laws.

The seven related commitments that accompany the goal of halving the number of undernourished are often forgotten. I will recall the seven commitments but mainly focus on the extent to which the hunger target has been achieved, what factors might explain the successes and failures, and what lessons may be drawn from these experiences.

The first commitment was to ensure an enabling political, social, and economic environment for food security. The second was to implement policies aimed at eradicating poverty and improving the physical and economic access to food by all. The third called for the pursuit of sustainable food production and rural development policies and practices in both high- and low-potential areas. The fourth was to ensure that trade policies are conducive to fostering food security for all. The fifth commitment was to prevent and forestall natural and human-induced disasters and to meet transitory and emergency food requirements. The sixth asked that public and private investments be allocated to foster human resource development, sustainable agricultural systems, and rural development in both high- and low-potential areas. And, finally, the seventh commitment was to implement these actions and monitor the whole plan of action.

Clearly, this was an extremely ambitious set of commitments and, unfortunately, many of them are difficult to assess quantitatively. The goal of reducing the number of undernourished, however, has a specific monitoring tool that FAO has been implementing. And since this is one of our main tasks, I will focus on that information.

The short answer to the question of whether progress has been made has already been commented on this morning, and, clearly, if present trends continue, the target of halving the number of undernourished cannot be met.

According to FAO's estimates, the number of undernourished declined in the developing world from about 830 million in 1990–92 (the World

per year. But if the World Food Summit targets are to be met, a decline of about 20 million every year is needed.

The latest assessments reported in *The State of Food Insecurity in the World* (SOFI), published by FAO in 2000, are the data we are using at this Conference. When you look at the data, it is critical to note the very large decline in the number of undernourished in East Asia, due in large part to the progress in China, and the slight decline in Latin America and South Asia. However, in Sub-Saharan Africa and Near East/North Africa, the number of food-insecure actually increased (see Table 1).

Number and percent of undernourished people, 1990–92 and 1996–98

	East Asia	Latin America and the Caribbean	Near East/ North Africa	South Asia	Sub-Saharan Africa	Developing world
Number of malnourished (millions)						
1990–92	283	59	25	299	162	828
1996–98	181	55	36	294	186	792
Percent malnourished						
1990–92	17	13	8	27	35	21
1996–98	12	11	10	23	34	18

Source: FAO, *The State of Food Insecurity in the World* (Rome, 2000).

TABLE 1

The percentage declines in the bottom part of Table 1 are only slightly better than the numbers, but the numbers remain the main focus of the commitment to halve the number of undernourished people.

Looking at the average daily energy supply, which is the basis for the FAO measure of undernourishment, we also see some improvement in terms of the numbers. Again, the biggest improvement has been in East Asia. In many of the other regions, the improvement was small or none at all (see Table 2). So, again, the regional differences are important.

Some progress has also been made in the quality of diet as assessed by the lower share of

Quantity and quality of diet, 1990–92 and 1996–98

	East Asia	Latin America and the Caribbean	Near East/ North Africa	South Asia	Sub-Saharan Africa	Developing world
Average daily energy supply (kilocalories/day/person)						
1990–92	2,660	2,710	3,010	2,330	2,120	2,540
1996–98	2,920	2,830	3,010	2,400	2,190	2,680
Cereals, roots, and tubers (percentage share in calories)						
1990–92	74	45	62	68	70	67
1996–98	67	44	61	65	69	63

Source: FAO, *The State of Food Insecurity in the World* (Rome, 2000).

TABLE 2

cereals, roots, and tubers in the total energy supply (Table 2). Again, however, most of this improvement was in East Asia, and—perhaps more important—the regional averages submerge the fact that in many countries the dependence on cereals, roots, and tubers was still over 70 percent, which is seen as a cut-off point for the quality of diet.

Similarly, regional and aggregate figures show some improvement in the quality of life as measured by life expectancy at birth and by infant mortality (see Table 3). Again it is important to note the regional differences and be aware of the fact that 32 countries actually saw life expectancy decline over this period, often because of the AIDS epidemic.

The stark reality remains that the decline in the numbers and the proportions of undernourished is

Nutritional outcomes, 1990–92 and 1996–98

	East Asia	Latin America and the Caribbean	Near East/ North Africa	South Asia	Sub-Saharan Africa	Developing world
Life expectancy at birth (years, female/male)						
1990–92	69/66	71/65	66/64	60/59	52/49	65/62
1996–98	71/67	73/67	69/66	63/62	52/49	67/63
Under 5 mortality rate (per thousand)						
1990–92	55	49	71	121	155	91
1996–98	44	39	56	94	152	81

Source: FAO, *The State of Food Insecurity in the World* (Rome, 2000).

TABLE 3

Key indicators for 13 countries where undernourishment fell

	Under-nourished 1980/1997 (percent)	Change (percentage points)	Real GDP per capita growth rate (percent)	Ag. production per capita growth rate (percent)
Benin	37/14	-23	0.9	2.9
Burkina Faso	64/32	-32	1.2	2.2
Cambodia	61/33	-28	2.0	4.5
Chad	69/38	-31	0.1	1.5
China	30/11	-19	8.2	4.2
Gambia	58/16	-42	-0.4	-2.5
Ghana	62/10	-52	-0.2	2.1
India	38/21	-17	3.2	1.0
Indonesia	26/6	-20	4.0	1.9
Mali	60/32	-28	-0.4	1.0
Mauritania	35/13	-22	-0.6	-1.4
Nepal	47/28	-19	1.7	0.8
Nigeria	44/8	-36	-0.7	2.4

Source: FAO, *The State of Food Insecurity in the World* (Rome, 2000).

TABLE 4

too small to meet the World Food Summit targets set about five years ago. If this pattern continues, the so-called business-as-usual scenario will leave us with about 600 million still undernourished rather than the 400 million target. Similar implications can be drawn for the 2020 target: unless something drastic happens, we won't get there.

I would like to focus now on the varied experiences of countries in the fight against undernourishment in the hope that we can see some common factors for success or failure. To do this, we compare the countries identified in the 1999 *SOFI* report where the proportion of undernourished people declined by at least 1 percentage point per year and those where the opposite happened.

The data, which are the same data on which the global assessment is based, show that 13 countries recorded a reduction in undernourishment of 1 percentage point or more for the period between 1980 (the average for 1979–81) and 1996–98 (see Table 4).

The range in the gain—that is, the reduction in percent undernourished—ranges from 17 percent in India to 52 percent in Ghana. If we look at the growth rates in per capita real gross domestic product (GDP) and agricultural production for these countries, most were positive, and the magnitudes of the few negative rates were very small.

...hunger has an economic cost, especially in countries where a large share of the population is undernourished.

In 11 countries the proportion of undernourished increased by 1 percentage point or more per year (see Table 5). The increases ranged from 15 percent in Cuba to 38 percent in the Democratic People's Republic of Korea. Note also that for most of these countries the per capita real GDP growth rates and the growth rates in agricultural production were negative. The magnitudes of the few positive rates were very small.

Thus the worst- and best-performing countries do show some patterns in terms of these measurements.

The other important thing to note is that the distribution of the best- and worst-performing countries is not strictly regional. They are found in most of the world's developing regions, including Sub-Saharan Africa, the region with the highest proportion of undernourished, at about 34 percent. In fact, eight of the best performers and six of the worst performers are in Sub-Saharan Africa, reflecting in part the extreme diversity of the agroecological and policy environments there which condition agricultural growth.

Key indicators for 11 countries where undernourishment rose

	Under-nourished 1980/1997 (percent)	Change (percentage points)	Real GDP per capita growth rate (percent)	Ag. production per capita growth rate (percent)
Afghanistan	34/70	+36	n.a.	0.0
Burundi	39/68	+29	-0.9	-1.6
Central African Republic	22/41	+19	-1.5	0.5
Congo, Dem. Rep.	38/61	+23	-4.5	-1.6
Cuba	4/19	+15	n.a.	-2.4
Korea, Dem. People's Rep.	19/57	+38	n.a.	-0.4
Liberia	22/46	+24	n.a.	-1.4
Madagascar	18/40	+22	-1.5	-1.7
Mongolia	16/45	+29	0.0	-2.3
Somalia	55/75	+20	n.a.	-1.8
Tanzania	23/41	+18	0.3	-1.4

Source: FAO, *The State of Food Insecurity in the World* (Rome, 2000).

TABLE 5

in part the extreme diversity of the agroecological and policy environments there which condition agricultural growth.

The political and socioeconomic conditions faced by the successful countries vary considerably, as do the major factors that contribute to reducing hunger. But the experiences of these countries still point to a few fundamental conditions that can be met and thereby contribute to the reduction of hunger.

The stark reality remains that the decline in the numbers and the proportions of undernourished is too small to meet the World Food Summit targets set about five years ago.

In addition to the statistics I have shown, other qualitative information on the best and worst countries helps in drawing conclusions. At the simplest level, for a given rate of population growth, reducing the proportion of undernourished requires a combination of (1) faster growth in per capita food availability through either production or trade and (2) improved access to food through higher incomes and/or social entitlement programs.

Reducing food insecurity at a broader level also requires improvements in basic health and education to allow for better utilization of food. These processes, however, cannot work effectively in the absence of social stability and peace. In other words, social stability and peace are essential.

Let me elaborate on a few of these points. First, the critical importance of agricultural development in reducing undernourishment is confirmed by the divergent experiences of the best- and worst-performing groups. An important reason for the success of the more successful countries was that they managed to increase per capita food and agricultural production at fairly high rates. Some of them relied on increased imports as well.

External agricultural aid per agricultural worker decreased in both the best- and the worst-performing groups of countries, but the decline was smaller in the more successful groups. So the external factor was an element as well.

Agricultural production and productivity can also be raised through public investment, as was the case in Benin, China, India, and Indonesia. The more recent experiences of Nigeria and Ghana with improved cassava varieties also point to the importance of investment in agricultural research.

The second element in reducing undernourishment—access to food—can be achieved through pro-poor economic growth. This is borne out by the fact that the more successful countries had positive real per capita GDP growth rates in nearly all cases. Access to food can also be increased by improving and increasing the human capital of the poor, especially their education and health, and by improving the status of women, as was pointed out in a recent IFPRI study.

The third fundamental element of success is that of peace and social stability. The experiences of Afghanistan, the Democratic People's Republic of Korea, and Somalia indicate the high cost of wars and other such calamities that disrupt access to food among vulnerable groups. In these countries, the number of people suffering undernourishment and other forms of deprivation has increased substantially as a result of conflicts and economic breakdown.

Finally, frequent natural calamities also contribute to success and failure. Although these are really not preventable, preparedness does ameliorate their impact.

In conclusion, I want to mention two main implications of this assessment. First, it is necessary to ensure that the poor and the vulnerable are not deprived of access to food. The provision of safety nets to protect livelihoods and ensure the survival of vulnerable people is a powerful investment toward that goal. In addition to informal safety nets that grow up in society, public policy measures must

include direct and indirect assistance. Aid programs may take the form of direct public transfers—such as food relief, supplementary feeding programs, food for work, and so on—and indirect public transfers—such as employment schemes and publicly backed insurance schemes.

Second, but most important, I would like to stress the central role of agriculture and rural development. Despite the evidence of the critical role of agricultural growth in alleviating poverty and hunger in developing countries, attention to development in national and international programs has been extremely low. Investment in agriculture and rural development in these countries has declined by more than 50 percent between 1986 and 1998. Government budgets have also been under strain because of adjustment programs and, as a consequence, rural finance markets have been badly affected, reducing the means available for farmers
to access capital.

At the same time official development assistance and the lending programs of the international financial institutions have also declined. Loan commitments for agriculture and rural development have dropped significantly. Although direct foreign investment is also important and has risen in developing countries, it has mostly bypassed the low-income countries and their rural areas. This shrinking investment in agriculture and rural development is eroding the very assets on which future farm output is based. Therefore, giving priority to agriculture and rural development will continue to be an FAO theme.

...with few exceptions, agricultural growth is the most effective path to reducing poverty and hunger in the least-developed countries.

At the World Food Summit: five years later, two themes will be emphasized: (1) mobilizing resources for agriculture in support of food security and (2) fostering political will to fight hunger. Whatever declarations or commitments emerge on these and related issues, the most important task is to tackle the issues related to how, where, and what measures are needed. While more and better research will always be helpful, there is growing evidence to support three main concerns and concepts.

First, we have said poverty is the main cause of hunger, but we also believe that alleviating hunger and malnutrition is important for the success of programs aimed at poverty reduction. In other words, you can't have one without the other. Second, hunger has an economic cost, especially in countries where a large share of the population is undernourished. And, third, with few exceptions, agricultural growth is the most effective path to reducing poverty and hunger in the least-developed countries.

At the last session of the FAO Committee on Food Security in May 2001, one of the delegates recalled what was written on the naked body of one of the protesters during the 1996 World Food Summit: "Empty Declarations." Let that be a reminder to us that we have to go beyond declarations and commitments. The hungry and the malnourished cannot eat declarations. They cannot eat commitments.

I am sure we all agree that we have to do more

Chapter 5

800 Million Still Hungry: Why Have We Made So Little Progress?

than make promises. I look forward to what we can learn here about how and where to take action to achieve sustainable food security for all. And I hope that these insights will be used by many countries in preparation for the World Food Summit: five years later.

Chair: Angela Thoko Didiza

Minister for Agriculture and Land Affairs, Republic of South Africa

As a Minister for Agriculture and Land Affairs from South Africa—one of the countries that forms part of Sub-Saharan Africa, where a number of the 800 million hungry people reside—I cannot stop every day to think about the question "Why have we made so little progress?" But I'm sure my colleagues in that part of the world, as well as all of you here today, do ask that question.

Other speakers have indicated what the difficulties have been and have challenged us about our responsibilities in making this world better for all of us. Clearly, as a country, but also as a region, we have been assessing what the problems have been, and why we have moved slowly.

One of the things we need to do is reevaluate our policies continuously, because when times change, environments change, and, therefore, we need to adapt. Some of the issues relate not only to the natural environment and concerns such as climate change, but also to the macroeconomic situation in the world and how, as we globalize, certain challenges, threats, and opportunities emerge.

As national governments, in partnership with civil society, we need to do more to invest in agriculture. And we need to ensure that as we do so, we make those poor people a part of the solution and not view them as a problem.

I'm sure that Africans, supported by the world, will work together to ensure that in the future we will never have poor people in the region. Africa itself—through the New African Initiative—has identified what we need to do to make it a better place for its citizens.

Some of the issues that have emerged from that Initiative deal with peace and security. We recognize that issues of conflict do affect the capacity of nations to produce for themselves, but we also recognize the importance of good governance, particularly economic governance by governments on the continent.

We also see the importance of diversifying the production sector and ensuring that we create market opportunities both internally, across regions of the continent, and also internationally. It is our firm belief that we need to invest in infrastructure but also in our human resource capacities so that we can invest in the future.

African leaders have committed themselves to these views and many others. As a part of our contribution to eradicating hunger and poverty in the world, this is what we will do for our people, working together with you.

I'm sure our panelists will also raise critical issues about how we can move ahead, what the problems have been, and why we haven't made more progress since 1996.

Volker Hausmann

Secretary General, Deutsche Welthungerhilfe

In the last decade of the last century, the existence, work, and role of nongovernmental development organizations (NGDOs) clearly emerged into public awareness. Exemplary of this was their appearance at important world conferences, beginning with the Rio Summit and following through to the World Food Summit in Rome. However, when the number of hungry people has still not decreased, everyone who believes in the power of NGDOs must give serious thought to their possibilities and their wasted chances. Alongside this stands the commitments made by various countries during international conferences; the role of NGDOs in demanding the fulfillment of these commitments is untouched.

The target of the World Food Summit is to cut the number of the hungry in half by 2015. To achieve that target, according to FAO, 20 million people must yearly and permanently escape hunger. In reality, only 8 million people succeed in doing this. The extent of the gap makes it clear that the increase needed cannot be expected, even from the totality of all operating NGDOs. Additionally, taking into consideration that democracy is not the self-evident, practiced form of government in most developing countries and that, in most of these countries, effective local and regional self-governing bodies do not exist, it becomes clear that the lobbying and advocacy work of NGDOs does have limits. In general, far too much has been expected from NGDOs in the North and the South.

Nevertheless, the specific advantage of NGDOs is now clear and recognized worldwide: they cooperate directly with the hungry and poor, in a way that sides with their interests. Although NGDOs cannot solve the problem of hunger alone, they know where the answers must lie: directly with and from the perspective of the people concerned. Only this approach ensures an effective answer and makes the abstract concept of a "civil society" concrete. And it is the only approach that corresponds to a human-rights approach.

What NGDOs can do on a local and regional basis (non-exhaustive)	What NGDOs are not able to do on a national basis (exhaustive)
Increase and disseminate agricultural production	Open market access through road and transport systems
Establish water supplies through wells or simple gravity systems	Operate technically demanding water supply systems
Build, establish, and expand social infrastructures (schools, basic health centers)	Train and pay teachers, doctors, and nurses
Begin processing raw agricultural products	Open markets and introduce brands
Establish and promote savings and credit groups	Achieve extensive access to the established bank system
Set up or promote small businesses	Create larger business communities to support the founding of business enterprises
Initiate land reform	Build up and sustain comprehensive extension services

Given this approach, it is useful to describe what NGDOs can achieve and where they come up against limits. I will take a few examples from the work of my organization:

These examples could be expanded. But they are sufficient to show that the limitations of NGDOs are always reached when the specific services of other systems are needed to drive forward further development. These services could be from government, research institutions, or the private sector. Here is where the lobbying work of NGDOs begins.

As diverse as the lobbying work of NGDOs is, the main audience for their work remains the same: governments or the community of nations and their institutions. Because development depends upon

As national governments, in partnership with civil society, we need to do more to invest in agriculture.

national and international frameworks and conditions, the concentration of lobbying work must also be maintained. Most recently, the campaign for debt reduction has had great success. This has involved ensuring that released financial resources were employed specifically for the targeted fight against hunger. It makes little sense to use funds released through debt relief to build hospitals in rural areas to treat the effects of malnutrition without fighting hunger itself. It is surely also necessary to stop the decline in development aid from donor countries and turn development around. The fight against hunger will only bear fruit when, at the same time, funds are focused on rural development. Given that current funding is generally concentrated on urban areas, that will be an especially difficult task for NGDOs in the South.

The fight against hunger will only bear fruit when, at the same time, funds are focused on rural development.

Advocacy work by NGDOs in matters of economics or science is much less pronounced than that in relation to the state. In those areas, NGDO's work is, before all else, often shaped by the criticism of particular developments, as the most recent debate over the meaning of biotechnology in the fight against hunger makes clear. That criticism is correct and important, especially in regard to the ever-increasing gap between rich and poor. But it would be fatal only to stay with criticism and not look for opportunities to cooperate.

Our starting point is that the number of the hungry has not declined. In light of this fact, NGDOs cannot avoid self-critical examination of their relations, especially in regard to economics. If one concludes that massive criticism of globalization alone will not motivate economic enterprises to contribute to the eradication of hunger, and one believes that the private sector can make an effective contribution toward the fight against hunger, then NGDOs must seek to cooperate with the private sector. In the end, this cooperation is dictated by the proper approach taken by NGDOs: they know the people who suffer hunger and they know that these people have a much shorter lifespan to wait for progress than the well-fed citizens of the North. Therefore, every chance for more support must be seized.

NGDOs can do more when they receive more money. And more investments are needed to ensure, first of all, self-sufficiency for as many of the hungry as possible. But self-sufficiency can only be sustained through further development in which NGDOs must cross over the borders of their own expertise. For example, the development of infrastructure and basic social services in rural areas is sometimes necessary. That type of development requires the participation of governments and international donor organizations. Significantly increasing the economic capacities of the population threatened by hunger is just as important. Further development means, before all else, bringing economic processes into action, something that business enterprises obviously understand better than most NGDOs. NGDOs have developed their work on a humanitarian basis and practice a nonprofit way of thinking, so they must ask business enterprises to make available their know-how for innovations that are not immediately profitable. In addition, business involvement must occur in the context of NGDO work, namely it must be adapted to the participation and capacities of the hungry. NGDOs must also develop ways to ask businesses if they are prepared to make available their products—for example, seeds—at prices that the hungry can pay, and consequently calculate prices that are specific to the clients and not necessarily cost-effective. Managers often claim that the business sector takes responsibility for the welfare of people. They must now provide practical evidence of this verbal commitment.

The same basically applies to the relationship of NGDOs to science. It seems to be necessary to ask researchers to become involved with improving the primary foodstuffs that small farmers already cultivate. Because of the existing knowledge and capacities of the target groups, this is probably the fastest route to increasing food production.

These are some examples of NGDO interactions with economic enterprises and research institutions. What is missing is the search for possibilities to bring coalitions together on a larger scale in order to achieve a greater and more widespread impact. Without such widespread impact, there will be no acceleration in the fight against hunger, and acceleration is imperative to achieve the targets of the World Food Summit and 2020 Vision in the prescribed time. This Conference offers a great opportunity for showing the way for such coalitions.

We in the research-based agribusiness industry are acutely aware that no contributors to that struggle can work effectively alone. We, and everyone else involved in this effort, want to be able to make a contribution.

Heinz Imhof

Chairman of the Board, Syngenta

Tackling hunger requires many different contributions. The agribusiness industry can help best through technology, but supplying this technology depends on the right environment.

As we consider the causes of hunger, let us recall how complex it is to feed people. In addition to planting, harvesting, and distributing food efficiently, all sorts of other factors also have to combine perfectly. Some factors have already been affected profoundly by technological change, including local innovations. Improvements in infrastructure have far-reaching benefits, for example, those that aid food storage and transport. It is difficult to prove that one individual factor is more important than another. What matters is that every contribution to making more food available is part of the solution. Those factors that can be influenced by human activity require very specific expertise.

The agribusiness industry is just one part of the campaign against hunger. The campaign has to be multifaceted, because hunger is a multifaceted problem. Our industry must concentrate on areas where its expertise can bring real benefits. That means concentrating on agricultural inputs. We have made great progress, but there is still a lot of scope for more. The UNDP *Human Development Report 2001* provides a clear example: "The reduction in undernutrition in South Asia from around 40 percent in the 1970s to 23 percent in 1997—and the end of chronic famine—was made possible by technological breakthroughs in plant breeding, fertilizers, and pesticides in the 1960s that doubled world cereal yields in just 40 years." That is impressive. But the figure "23 percent" reminds us that there is still a gap, and the gap is growing at a daunting rate. The world's population is predicted to rise to 8 billion by 2025, while calorie demands are doubling. How can we help close the gap?

Improving yields and food quality—as opposed to extending farmland area—is the only sustainable choice. Our key contribution is technology. Technology leads to new products—on the one hand through chemistry; on the other hand through biology, biotechnology, and genomics. With chemistry we aim, for example, for better targeting. The more scientists learn

about insects, weeds, and fungal diseases, the better they can develop molecules that tackle specific problems. That approach has two advantages. It deals with a problem more completely and further reduces burdens on the environment. The former raises yields, the latter helps make intensive agriculture sustainable. In the long term, the knowledge we gain from genomics promises to speed up these processes dramatically and help us produce even more healthy food.

Here are some examples of new products from our work in chemistry. Our company has an insecticide called Chess® that stops carefully targeted insect pests from wanting to eat. So crops get a chance to grow and feed people. We also have a herbicide called Dual® Gold, an improved version of an older product. By selecting the relevant active molecule in the original, larger compound, our chemists were able to halve the amount of herbicide needed. That means less "chemistry" gets into the environment, less packaging is required, and less fuel is used to transport the product. Yet the effects on the weeds that compete with food crops are just as impressive as before. Our herbicides Touchdown® and Gramoxone® replace laborious hand-weeding, and help with zero-tillage agriculture. The benefits from reducing erosion are rapid and long lasting.

Another vital contribution from our industry is in the area of seeds. Today, most improvements are still made by conventional breeding. Increasingly, however, crops will be enhanced by modern biotechnology. Seed development will benefit more and more from the insights provided by genomics. As the *Human Development Report 2001* puts it, "Transgenics offer the hope of crops with higher yields, pest- and drought-resistant properties, and superior nutritional characteristics—especially for farmers in ecological zones left behind by the green revolution." Biotechnology offers hope of a much broader spectrum of improvements than do chemical farm inputs. Plants that can cope better with hard conditions, or produce healthier food, add crucial weight to the world's struggle against hunger and disease.

We in the research-based agribusiness industry are acutely aware that no contributors to that struggle can work effectively alone. We, and everyone else involved in this effort, want to be able to make a contribution. We can all only do so if we cooperate, adapt new technology to the requirements of the needy, and make this technology available in a socially responsible way. The business environment must also be right.

Unfortunately, some sections of society continue to block selected avenues of hope. To us, this often seems an automatic principle. A recent example is the criticism of "Golden Rice." Together with other approaches, Golden Rice could, one day, help reduce vitamin A deficiency and infant blindness. Yet, before breeding work by the International Rice Research Institute (IRRI) has really begun, critics tell us the new product is inappropriate and that people would do better to substitute some rice with vegetables such as carrots. In our view, enhancing a key staple diet like rice *must* be a high priority. We should all support promising new approaches, even if they look like only partial solutions. We should also continue to engage in dialogue and continuous learning.

Also central to our contributions to producing more and better food is the business setting. Research successes often come from investment by private enterprise. That will continue to be the main setting in which people achieve results. For that to happen, it has to be accepted that warding off pests or breeding healthier crops is a justified way of earning a living. Our industry has demonstrated that it can make new technology available in a socially responsible way. We also continually show our ability to work in partnership with public and academic organizations as well.

Private investment is inextricably linked to another factor that affects our ability to help. That is intellectual property. If we

We should all support promising new approaches, even if they look like only partial solutions.

are to translate research into progress, we must have the chance to recoup the considerable investments involved. That is only possible if intellectual property rights are respected.

Another major factor is a stable and effective regulatory framework. This has to be based on sound science and be reliable in the long term. Facilitating such a regulatory environment in the developing world is another key to tackling hunger.

Despite the many hurdles the research-based agribusiness industry faces, we believe that we can contribute to the struggle against hunger. We can do so in our chief areas of expertise —chemical and biological products and technology. For that contribution to bear fruit, we need the pragmatic cooperation of numerous parties. Tackling hunger is one of the world's most important tasks. We want to work together to achieve all we can.

David Beckmann

President, Bread for the World

It seems to me clear that the main reason we haven't made faster progress against hunger is that we haven't tried very hard. Start with my own country, the United States. When FAO began to talk about the World Food Summit, my government took the position that it wouldn't attend unless there was a pre-agreement that the summit would not call on the industrial countries to spend any more money.

That is really true, and for five years now, the U.S. officials responsible for follow-up to the World Food Summit have been under very clear instructions from the White House not to do or say anything that could cost the U.S. government more money. And my government isn't alone in its lack of commitment. We have talked about the drop in official development assistance, especially to poorer countries. Moreover, very few developing countries demonstrate clear priority for poverty reduction or hunger reduction. NGDOs do a good job, but as Mr. Hausmann has so clearly said, they have limited resources and limited powers.

It seems to me clear that the main reason we haven't made faster progress against hunger is that we haven't tried very hard.

IFPRI's 2020 Vision documents have shown very clearly a lot of things that we can do to accelerate progress against hunger. This is not rocket science. But what most impresses me about IFPRI's analysis is that it wouldn't even cost very much to make dramatic progress against hunger.

IFPRI's estimates in *Global Food Projections to 2020* show that we could reduce child malnutrition by more than 40 percent by the year 2020, and it would cost the world, the whole world, about $10 billion more a year. The world spends $40 billion a year at McDonald's restaurants.

So, clearly, what we need to do, as President Rau said, is to become the hunger lobby. We need to go back to our own countries and insist that our own governments, whether they're developing-country governments or industrialized-country governments, do the things that so clearly could accelerate progress against hunger.

I do have some promising news to report from the United States. It's not good news yet, but it's promising news. A recent public opinion poll showed that American attitudes toward foreign aid and world hunger have become markedly more favorable over just the last five years. Americans are still very skeptical about the capacity of governments to reduce poverty. They're very concerned about corruption. But 83 percent of Americans said that they would like our government to take part in an international initiative to cut world hunger in half by 2015. And, overwhelmingly, they said that they would be glad to pay more taxes to help pay their share of the cost. That's a change from where we were five years ago.

Bread for the World, the organization that I lead, helps U.S. citizens put pressure on their elected officials to do more to make our government a greater force for the reduction of hunger in the United States and around the world.

We are a completely different organization from Brot für die Welt in Germany. We don't provide direct assistance. We organize pressure on the U.S.

government to push for policies that will help reduce hunger. So, for example, we helped to enhance U.S. bipartisan political support for the debt relief initiative.

This year, we are focused on trying to increase U.S. development assistance to Africa by about $1 billion a year. We envision that increase as part of a larger global initiative to boost development assistance and other kinds of support for poverty-focused development in Africa.

We need to forge a coordinated lobbying effort to get the G-7 to live up to their commitment.

The Bread for the World resolution has already passed the U.S. Senate. It calls on President Bush to work with the leaders of other nations—African nations and the industrialized nations in particular—to come up with a plan to reduce hunger, poverty, and disease in Africa. The resolution also says that Congress should provide the United States' appropriate share of funding to support that plan.

Now, we think we've already had some influence on President Bush. Whether it's because of us or because of other factors, President Bush has done and said some things that are quite hopeful for our cause. I had low expectations for him when he came into office, but President Bush sent two ministers of government to Africa in the first six months of his administration. In July, he gave a speech on world poverty that I could have given. It stressed democracy and markets and increased investment in health, education, and agriculture.

Then he went to the G-7 summit. The G-7 spent two-thirds of their time this summer talking about world poverty. They made some modest but significant commitments, including the commitment to support the African recovery program that the African heads of state have developed.

Maybe this is all rhetoric and won't result in much. But I think our job as the hunger lobby is to start with the political reality and to move it toward overcoming hunger. We have to seize the opportunity of the moment. And the fact that a conservative U.S. president is talking about reducing world poverty is an opportunity. I don't believe any other U.S. president in history has given a speech on world poverty in his first year in office.

Let me finish by being quite practical about the possibility that some of us will focus on this new international partnership with Africa and will lobby to make it real. Thanks partly to President Mbeki of South Africa, the African heads of state have come up with a promising plan for African recovery. The G-7 have committed themselves to working together with African leaders on a global partnership to reduce poverty in Africa. Africa is the only part of the world where hunger is both pervasive and on the increase. So it makes sense that we should focus on Africa.

In a number of countries—both in Africa and in the industrialized world—there are civil society movements to support this new partnership with Africa. A new U.S.-Africa alliance, called the Partnership to Cut Hunger in Africa, is one such effort.

Those of us who are working in different parts of the world to support and shape this international partnership with Africa have to find ways to communicate with each other more than we have done in the past.

I'm specifically looking for some institutional partners or people in governments, especially in the G-7 countries. We need to forge a coordinated lobbying effort to get the G-7 to live up to their commitment. It would be great if Syngenta or other business corporations would help us lobby in a very specific, immediate way for better trade and aid policies toward Africa.

We could cut world hunger in half within the

next couple of decades. This opportunity is new in the history of the world. I'm a preacher, and I see this as a tremendous gift and responsibility from God. The main thing we need to do to make it happen is to turn ourselves into the lobby against hunger. We need to push in a step-by-step, sustained way for the policy changes that we well know can lead toward the ending of hunger. Some of us could live to see the day.

Discussion

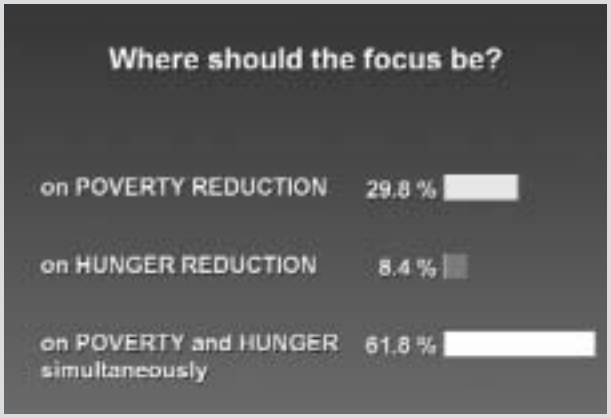
The debate over poverty versus food insecurity dominated the discussion. A participant commented that the session's presentations reflected disagreement on whether poverty is more important than food insecurity. If a great deal of work is being done on poverty (such as the poverty reduction strategy papers that governments are preparing in partnership with civil society and development organizations such as the World Bank), is there a need to focus on food? Should we be concerned with food security or livelihood security? The youngest participant at the Conference pointed out that the most productive way of dealing with the debate was for half the audience to leave thinking food was more important and to work on issues of hunger and for the other half to work on poverty. The Chair, Honorable Minister Thoko Didiza, agreed that the problem is indeed not one or the other, but both. William Meyers, following up on his earlier presentation, reiterated that alleviating hunger and malnutrition is just as important as alleviating poverty and that in fact the existence of hunger and malnutrition reduces the efficacy of poverty reduction programs.

Another key area of discussion concerned whether or not the poorest of the poor are being reached. The debate began when a participant asked how sustainable food security for all by 2020 is possible if a growing number of poor people, especially in AIDS-affected households, are not reached. Do development projects and NGOs reach the poorest of the poor? Another participant proposed encouraging developed countries not only to increase their amount of overseas development assistance, but also to change their procurement patterns in order to reach the poorest populations. Volker Hausmann responded that projects can and do reach the poor. He agreed, however, that better public awareness and communication of concrete information about development projects would make the public more willing to pay taxes to support these populations. David Beckmann emphasized that much development assistance, 90 percent, never reaches the poor and that development assistance mainly reaches people in the 20th to 50th percentiles—not the poorest of the poor. Therefore, the link between stronger public support and better performance of development assistance in reducing hunger and poverty is key. For people at the very bottom, such as widows, orphans, and people with disabilities, it is a matter not only of improving livelihoods, but also of providing subsidies and safety nets.

Is there a political cost of hunger? A participant stated that no government is threatened or overthrown by hungry people. Meyers responded that those who are the poorest are often the

hungry and malnourished and also the least empowered. They have the least political clout and are marginalized in other ways. Therefore, the low political cost of hunger can lead to less action by decisionmakers.

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

A participant asked about the strategy of providing seeds to small-scale farmers similar to those initiatives providing medicines for HIV treatment. Heinz Imhof replied that since seeds have a breeding area of about 200 to 250 kilometers, they must be developed locally. The way to provide seeds to small-scale producers is to help them develop their skills in breeding local crops and to contribute technologies. Although large quantities of seeds can be shipped to specific countries in need, high-quality varieties must be developed locally. Industries in developing countries can provide technological, regulatory, and technical assistance in the field to ensure that local breeders have the latest inputs. In subsistence areas, these technologies should be given free of charge.

The role of the private sector was discussed. A participant pointed out that the private sector's role is increasing in food production and the production of inputs like chemicals, pesticides, and fertilizers. Therefore, private-sector companies should be called on to invest some of their profits in developing seeds to cope with difficult problems like drought, salinity, and hot climates, especially via biotechnology. Hausmann added that he is in favor of involving business companies in the fight against hunger, but not at a national level, because economic growth on a national level as a precondition for fighting hunger depends on the so-called trickle-down effect, which does not automatically occur in rural areas. Although businesses might not gain an immediate return on their investment when they go into rural areas, they can help by offering know-how and by lowering product prices.

Other issues mentioned during the discussion included whether economic growth is compatible with ecological stability, the need for subsidies for protection, and whether to focus on increasing agricultural production or on ensuring that the hungry benefit from the food that is already available.

The illustrations and text featured here are by Marcel Niyungi Bin Yungi, an artist born in Zaire and now living in Kenya. The 2020 Vision Initiative commissioned him to create comic strips depicting his perspective on key food security issues.

Chapter 6

Perspective from the Next Generation

David Dalrymple—the younger generation's perspective on the future.

David Dalrymple

Student, U.S.A.

Life is full of contrasts: black and white on this paper, right and wrong, and the lives of those children born in developed countries versus those in developing countries. I'm going to focus on that last one. I stand before you in a new suit, surrounded by well-educated, experienced adults who can broaden my knowledge and understanding of the world. I live in a house large enough to have my own room, complete with a desk and a wall of bookcases full of stimulating reading material. I'm growing up with the benefit of amazing technology, even in things such as toys like Lego MindStorms. I have many opportunities to take classes in various topics. I have the stimulation of concert halls and museums and travel. I have a hotel room in Bonn, Germany, many miles from my own home. I am vaccinated against most major diseases. I have a healthy mother who has never had to work any fields in order to feed me and has plenty of time to interact with me. I have a healthy father who has free time to teach me his trade of programming. I have never had to worry when I hear we are due for a dry spell that I might have to go a day or more without food because of it, let alone starve. The worst that could happen in a dry spell for me is that we might not be allowed to wash our cars. The only time I have to worry about missing a meal is if I am at camp and the dinner served is vegetable lasagna, something I suspect many children in developing countries might enjoy and feel blessed to have. Because I normally have a full stomach, I can focus on learning and solving problems. That can be hard for children whose basic needs, such as nutrition, are not being met; and it can become a nasty cycle, because usually one must be able to think clearly to work or learn how to get food. There's a reason that people so often see me smiling and hear me laughing—I'm leading a very good life.

There's also a reason those faces on the photos many of us have seen from developing countries look at the camera with straight, glum, sweat-ridden faces. Many work the fields all day—they are hot, tired, and hungry. When they're not working the fields, they're often caring for a relative afflicted with malaria, AIDS, or some other disease. They get little sleep between nightfall and dawn. They have little or no technology for agricultural purposes or for entertainment. They often have little to no access to education aside from their parents, and many are illiterate. Their lives depend, quite directly, on the quality and quantity of their work. If a computer programmer has bugs in his

programs, he can probably fix them and survive, but if a farmer gets bugs in many of the plants that he is growing, he and his family could perish.

Is it fair for people born in America or other developed countries, who have had the privilege of living comfortable lives, to turn a blind eye on the starving families who were so unlucky as to have been born in developing regions that lack the many things I have just noted? Should we ignore those who could be famous masterminds if only they could be transported to a developed country or better still, have the same securities and opportunities that we in developed countries often take for granted? All have the capacity and right to learn, and to live a healthy, happy life.

The hungry people looking so gloomy in the photos could be well-fed, happy, and more productive if they got proper education and welfare. The program that gives students or even entire families food for children attending school is a good start toward improving education. In general, I oppose external reward programs for education because they often make people more interested in the reward than learning and take away from the enjoyment and appreciation of learning for the purpose of growing and having a better understanding of the world. However, this reward system solves two problems. First, because in some developing countries, children would be forced to work fields or otherwise work to help feed their family, rather than go to school, this program allows them to go to school without hurting the family's health. Second, even if they were able to spend the day in school rather than working to grow food or earn money, they might not learn well if they had an empty stomach or were worrying about others in the family who were hungry. Giving them food and strengthening their bodies allows their minds to function better. So, rewarding school attendance seems to be the best option conceived of to date. Many other tasks need to be undertaken. In addition to children needing to be able to attend school, poor citizens need jobs. Farmland areas should be organized so that forest degradation can be dramatically reduced. I hope for an overall reduction in population growth in developing countries. Water must be conserved among growing populations. Water- and food-providing associations must emerge for equitable distribution of water and food in organized groups. Agricultural technology must be sent to developing countries to increase efficiency and productivity. Aquaculture production must be reformed and extremely well monitored. People need to understand that the goal of developing countries should not be merely to become self-sufficient in their food production but to work toward self-reliance. That is, rather than growing all the foods they need for their own consumption, countries should use agriculture and other methods of improving their economy to earn the income to purchase the foods their citizens need.

One such method could be Little INtelligent COmmunitieS (LINCOS), a project sponsored by the Massachusetts Institute of Technology that provides computer stations to developing countries for their people to experiment with computers and other technologies. Once an individual masters the computer, he or she may then write software or create devices that can be sold on the global market as a viable product. Such computer stations can also help educate citizens through educational software and a connection to the Internet and World Wide Web. One use for computer education could be to show orphan children how to farm (though obviously this would not be a preferred substitute for human teachers or parents). Technology would be a substantial benefit to hard-working craftsmen in developing countries: they could open their own website and begin e-business trading. It would truly open a whole new world.

Anything you do or don't do will affect what I, and the rest of my generation, will have to deal with in the future. My peers and I will be in our late twenties in 2020 and will then be entering the

Anything you do or don't do will affect what I, and the rest of my generation, will have to deal with in the future.

role of decisionmakers. I implore the decision-makers of today to take action now so my generation will not have as many of these issues to contend with in the future. Anything possible should be done. What seems impossible to many should perhaps also be attempted. To ignore these tasks is to condemn more than 1 billion people to being miserable for life. This is hardly consistent with any definition of human decency. We should strive to be able to make a claim like McDonald's by the year 2020 and be able to say we have served over 1 billion people—though as you can guess, I am not suggesting we serve them hamburgers.

Award Announcements

Poster Competition Winners
Kayla Horn, 10 years old, Becky Bruning, 9 1/2 years old, Ellisville, Missouri,

2020 Youth Competitions

"Many of the priorities that we are setting, the decisions that we are making, and the ways in which we are behaving will have long-lasting and wide-reaching implications." It was with these words that Rajul Pandya-Lorch, head of IFPRI's 2020 Vision Initiative, conveyed during an award ceremony on the first day of the Conference why IFPRI felt that in preparation for the Conference, it was very important to hear from the youth. She continued, "What do they see as the key problems leading up to 2020? What concerns them most? And what solutions do they have to offer to lead to a food-secure world for all in 2020?"

The Initiative invited young people from around the world to share in pictures and words how they saw our world in 2020 and what they would do to assure a better world for all in 2020. Two competitions were held: a poster competition for children between the ages of 7 and 14 and an essay competition

Per Pinstrup-Andersen, Director General of IFPRI, and Rajul Pandya-Lorch, Head of IFPRI's 2020 Vision Initiative, congratulate Thrishni Subramoney for winning the grand prize of the youth essay competition.

Poster competition grand prize winners Becky Bruning and Kayla Horn from Ellisville, Missouri, USA pose with their winning poster during the award ceremony at their school, the Center for Creative Learning.

for youth between the ages of 15 and 18. These competitions were undertaken in collaboration with Mellemfolkeligt Samvirke (Danish Association for International Cooperation). More than 600 youngsters from about two dozen countries participated in the poster and essay competitions and shared their creativity, insights, and aspirations.

During the ceremony, Ebbe Schiøler, the chair of the poster and essay juries, shared with the Conference participants what came out of the competitions. He remarked that the essays and posters "reflected solidarity, compassion, care, and indignation. These were not messages from a happy-go-lucky generation. Here spoke young, international concerned citizens… the main message is: 'Do something about it. You should be the shakers and the movers. Make the world a place of fair play and let us share.'"

Kayla Horn and Becky Bruning, students at the Center for Creative Learning in Ellisville, Missouri, in the United States of America won the grand prize for their poster entry. The runners-up were Class 6C/sk at Tilstskole in Tilst, Denmark, and Class 2a at Hørup Centralskole in Sydals, Denmark. There were five runners-up for the essay competition: Medhanit Adamu Abebe, Ethiopia; Nana Yaa Gyau Dodi, Ghana; Lungisa Fortune Mngadi, South Africa; Achinette Joy B. Villamor, Philippines; and Priscillah Wanjeri, Kenya. The grand prizewinner of the essay contest was Thrishni Subramoney of South Africa. In accepting her award at the Conference in Bonn, Subramoney moved the Conference participants with her remarks:

> It is by watching people like you, who are prepared to work selflessly to improve the lives of others, that inspired me to write my story. I come from a country, a continent where hunger is a daily trial for too many people, and when a problem is so widespread, it is sometimes too easy to turn a blind eye and say, "What can I do? Feeding one person won't make a difference." This is why I have grown to have an undying respect for those that answer and say, "But it will make a difference to that one person." In South Africa, and all over the world, there are many such heroes.

> My story is a tribute to them. It is based on the belief that even though a problem like famine may seem intimidating and unstoppable, it doesn't stand a chance against the unity and perseverance of mankind. …My story was meant to be a message of hope and belief and faith and possibility. But standing here today, looking at you, I feel certain that when my generation steps into your shoes, it will be merely to wield the torch against the darkness that you, through your great work, have already lit.

Thrishni Subramoney discusses her winning essay with Minister of Agriculture Thoko Didiza of South Africa and other participants.

The works of the youth were highlighted throughout the days of the Conference, as short slideshows of poster entries were shown during breaks in the sessions and selected posters hung on the walls of the Conference center. The youth "demonstrated a personal commitment to making a better world for all in 2020 and are an inspiration to us all," Pandya-Lorch noted during her presentation. The anxieties, aspirations, visions, and expectations of the next generation are compiled in the IFPRI 2020 booklet, *A Better World in 2020: Wake-Up Calls from the Next Generation.*

World Food Prize

During the Conference, Robert Havener, member of the World Food Prize Foundation's Council of Advisors, announced the award of the 2001 World Food Prize to IFPRI's Director General, Per Pinstrup-Andersen. Havener remarked that the award is in "recognition not only of his own professional contributions, but for the establishment of the 2020 Vision Initiative, of which you are all a part." In a video that was shown to the Conference participants, Ambassador Kenneth M. Quinn, president of the World Food Prize Foundation, remarked that Pinstrup-Andersen "has been not only a partner, but indeed a leader, in the great global effort to eliminate the contrast between poverty and prosperity, to turn pain into promise, sorrow into joy, for the most disadvantaged in the world." Quinn continued, "Through his global initiative, the 2020 Vision for Food, Agriculture, and the Environment, our Laureate has issued a clarion call that now is the time to eliminate poverty, hunger, and child malnutrition. For, if not countered, large-scale poverty and hunger will lead to serious environmental, economic, and social disruptions and even war." More can be found on Per Pinstrup-Andersen and the World Food Prize on IFPRI's website at http://www.ifpri.org/pinstrup_wfp/awards.asp.

Chapter 7

Alternative Futures for Food Security

Chair: Manfred Kern
Head of Global Technology Communication,
Aventis CropScience

It is an honor for me to chair this session on the future of food security, a topic I have dealt with for a couple of years. I'm also pleased, as a representative from the crop production company Aventis CropScience, to take part in the forum of an NGO, IFPRI. It offers excellent dialogue possibilities. At the moment, by our own forecast, we have a world food security level of only 0.25 percent: global food production is only 0.25 percent higher than global food demand. Furthermore, we must keep in mind that we have to double our food production in the next 25 or 30 years. That means we will have to produce more food than during the last 10,000 years together. Thus we must have a more science-driven discussion, rather than one driven by politics. Alternative futures for food security is a very challenging issue, and it will be difficult to find a solution, not least because of the complex world we live in.

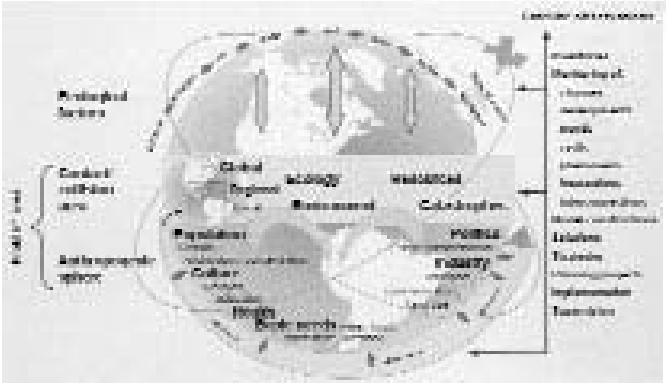
Figure 1 illustrates the complexity of the global system. It shows just some of the relevant issues: the ecological parameters on the one hand and the anthropogenic sphere, which comprises global and regional issues of population, culture, health, politics, industry, and basic needs, on the other. So the global perspective requires multidisciplinary action, and it is very difficult to find the right way within this complex network.

It is made more complicated by the experience of time and space for the world's people. Consider, first, the family. The family makes plans for this week and next week and the coming months. Politicians look ahead about four years, most of the time. It is very difficult to plan for a lifetime, meaning 20 or 25 years. And establishing a vision for the next generation is a particularly daunting task.

What do we mean by establishing a vision? The essential principle of one is given to us by Agenda 21, principle 3: "the right to development must be fulfilled so as to equitably meet the developmental and environmental needs of present and future generations" (see Figure 2). You can see in the figure the different generations: the elderly person, the couple in the present—who I would venture to say is us—and then the child responsible for the future. At the end you see the pigeon of freedom, of peace. We, in the present, have to find solutions for making progress in the direction of peace and sustainable development.

And now we should spend a few seconds picturing the disturbing images of war and hunger that we have all seen on television. Everyone is

A Global Perspective



Source: Technology Communication, Manfred Kern/Jürgen Geiß, Aventis CropScience

FIGURE 1

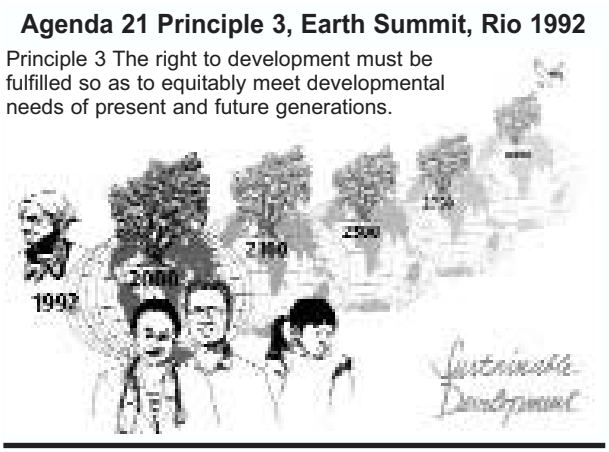
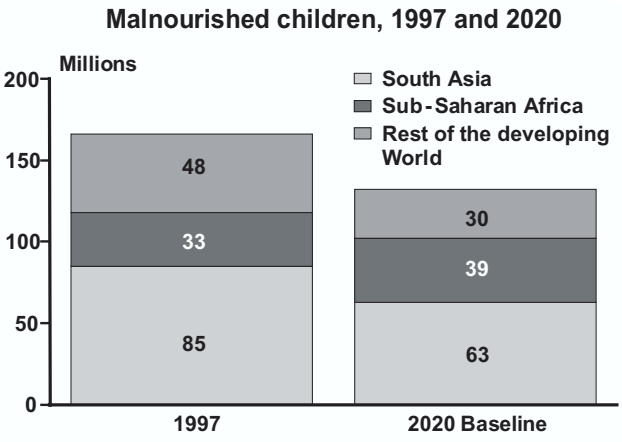


FIGURE 2



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 1

familiar with the problem of hunger in the world. But I think we should take the time to contemplate the awfulness of it—few words are required for its terrible meaning to sink in. It is a world without a sustainable vision.

To build an alternative world, let us consider a quote from Antoine de Saint-Exupery's *The Wisdom of the Sands:* "As for the future, your task is not to foresee but to enable it." That is a challenge and responsibility to future generations that all of us must face.

Finally, I think the best view we have for our children comes back to Agenda 21, principle 21, that "the creativity, ideals, and courage of the youth of the world should be mobilized to ensure a better future for all." One representative of the youth of the world has already spoken to us. We should keep his words in mind, and nurture our youth, as we try to create a world that is far better than the business-as-usual future shown to us by our economic models.

Mark Rosegrant
Senior Research Fellow,
International Food Policy Research Institute

The key point I want to make today is that the world really does stand at a fork in the road. The path that we take through our policy decisions and through our choices and levels of investment in the poor and in developing countries will fundamentally determine the rate of progress that we will achieve in reducing malnutrition.

Unfortunately, if we continue on with current policies and current levels of investment, we will see unacceptable rates of progress in reducing child malnutrition.

In 1997, the most recent year for which complete data are available, there were 166 million malnourished children in the developing world (see Figure 1). If we continue on the same investment paths for agriculture, health and nutrition, and education, and with the same kinds of policies for income growth and agricultural development growth, we will reduce that number only to 132 million malnourished children by 2020. That's seven times the total number of children in the European Union or in the United States.

Moreover, if the current levels of complacency that we see today continue, and if investment levels continue to drop, then we could see an actual increase in the number of malnourished children in the world to 175 million.

Alternatively, with policies that lead to moderate improvements in income growth and moderate reductions in population growth, combined with investments in agriculture, education, and health, we can make much more serious inroads against child malnutrition than we are currently making. We can at least double the progress compared to what we see in the baseline and reduce the number of malnourished children to 94 million by 2020.

Where are the malnourished children? Where is the most serious problem? Figure 1 divides the baseline according to some of the key regions, using the 1997 actual level and the 2020 baseline projection. The most serious problem is in Sub-Saharan Africa, where we project an actual increase in the number of malnourished children, an additional 6 million by 2020.

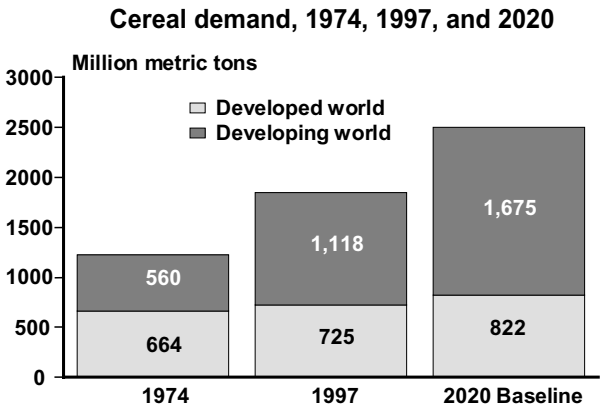
South Asia obviously is cause for concern because that is where most of the malnourished children in the world are. Progress will be made, but there will still be 63 million malnourished children in South Asia.

At the end of my talk, I will go back and discuss a little bit about what we can do to make the world look at least a little better than this. First, I want to identify some of the underlying or emerging trends in food production and demand that contribute to driving this particular process.

Let me digress just for a moment to mention that these results and the analysis we're doing are from IFPRI's IMPACT model (International Model for Policy Analysis of Agricultural Commodities and Trade). It is a simulation model that can project food production and demand, prices, and trade, as well as malnutrition to 2020 for 16 commodities and for 36 countries and regions in the world. The analysis attempts to provide explicit assumptions regarding likely changes in policy, investments, technology, and behavioral parameters, and then projects what the outcomes will be given these changes. In addition to this baseline projection, which presents our best estimate of where we think policies and investments are going, we can also run a number of alternative scenarios, both pessimistic and optimistic.

Let's first look at what we expect to happen in cereal demand in the future. Population growth rates are declining in the world, but the total amount of cereal needed will increase as much between now and 2020 (or between 1997 and 2020) as it did in the previous 23 years—about 654 million metric tons (see Figure 2).

What is the source of that demand? First, many developing countries have rapid income growth. Second, population growth does continue to have significant built-in momentum. A third major factor is the rapid increase in demand for cereals for feed, particularly in the developing world. Thus, it is the developing world that will account for almost all the growth in cereal demand. By 2020 two-thirds of the demand for cereals will come from the developing world.



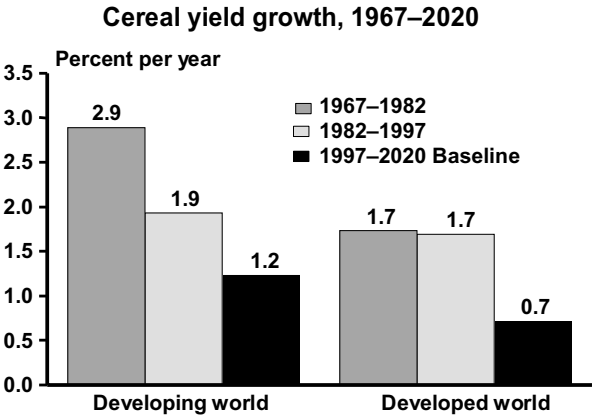
Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 2

To meet that demand, we need to grow more food. Where is that food going to come from? Primarily it will come from crop yield growth—not totally, as was implied this morning—but we're projecting that three-fourths of future growth in cereal production will come from increases in productivity. About a quarter will come from expansion of land, primarily in Sub-Saharan Africa and Latin America.

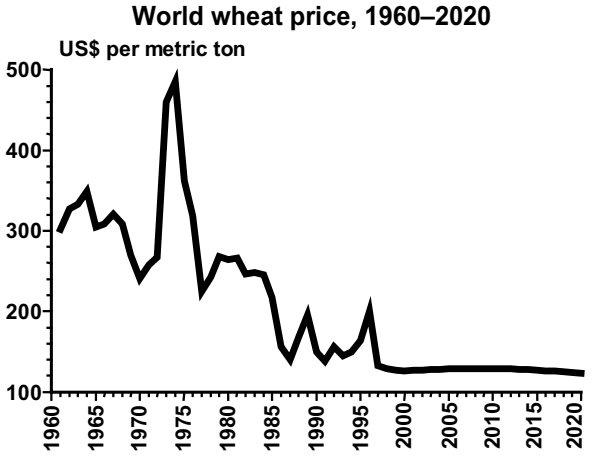
This reliance on cereal yields is cause for considerable concern. As you can see in Figure 3, we have already started a process of decline in crop yields in the developing world. It appears to be beginning now in the developed world as well, and we project it will continue there.

Crop productivity is slowing for a number of reasons. These include the declining investments in critical agricultural research, in rural infrastructure, and in other major shifters of production. In addition, many parts of the world already have achieved relatively high yields and are using high levels of inputs. It is simply harder to push yields further under those conditions.



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 3



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

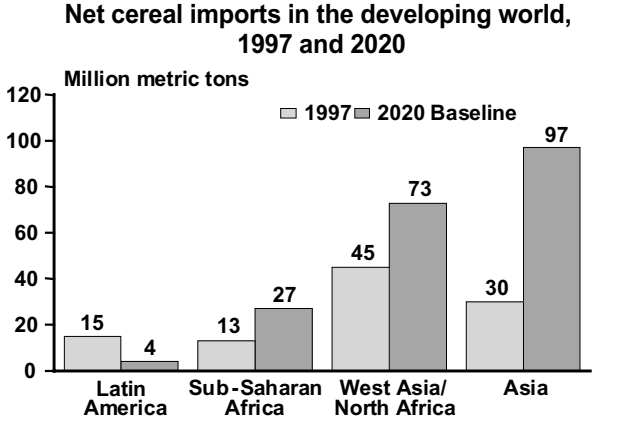
FIGURE 4

Finally, we seem to be facing much more serious environmental problems as we proceed. Among the most important of these appears to be increasing water scarcity and declining water quality. It will require a major effort in agricultural research and policy work to maintain the kind of yield growth shown here without damaging the environment.

We're projecting a big structural change in terms of world cereal prices. We trace the historical price of wheat and then show the projected price to 2020 (see Figure 4). We project that prices will no longer decline as fast as they have in the past. We saw almost a 50 percent decline not only in wheat prices but in rice and maize between the 1960s and 1997. But we see only small additional changes because of the declining productivity growth relative to increasing demand.

One other important sign is due to the relatively slow growth in developing countries' production compared with demand growth: developing countries will rely much more on cereal imports in the future. We see about a doubling of cereal imports in those regions as a whole (see Figure 5). Latin America is the one exception, but that exception is driven totally by Argentina, which will double cereal exports between now and 2020. The rest of Latin America will have significant increases in imports.

...developing countries will rely much more on cereal imports in the future.

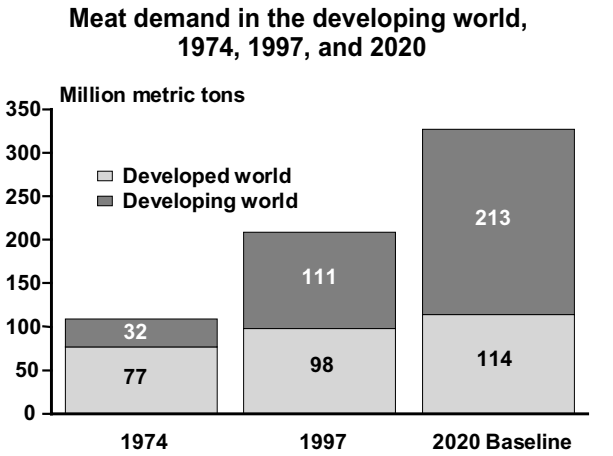


Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 5

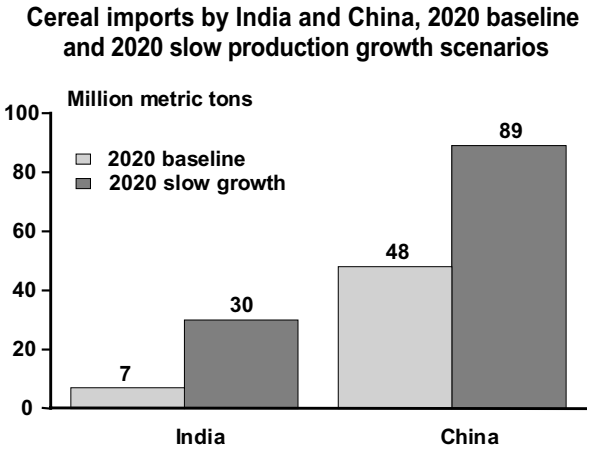
For the rapidly developing countries in Asia, increased imports are not necessarily a problem. They're growing very fast economically, and increased imports will provide food at reasonable prices. But for the poorer countries in Africa, the Middle East, and North Africa, where demand is driven more by population than by income, these kinds of imports may cause serious problems and financial burdens.

We expect meat demand to grow explosively in developing countries (see Figure 6). The doubling



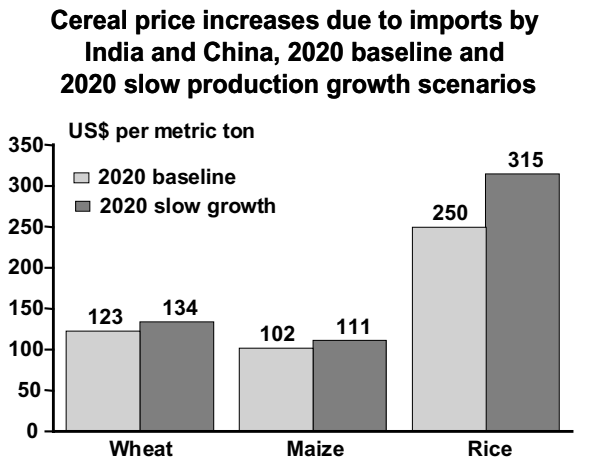
Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 6



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 7



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

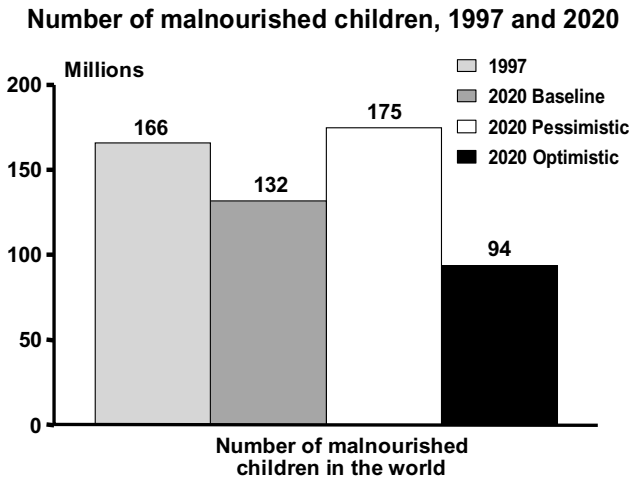
FIGURE 8

of demand between now and 2020 will be driven by urbanization, rapid income growth, and some changing tastes—in many cases in favor of more Western-style diets. Very little growth is expected in the developed world compared with developing countries.

The forgotten crops in the world food equation have tended to be roots and tubers: potatoes, sweet potatoes, yams, and cassava. Our projections indicate that demand for these commodities will grow even faster than for cereal commodities. In Asia, demand is growing rapidly because of fast growth in demand for potatoes as a luxury good and for sweet potatoes as feed in China. In Sub-Saharan Africa, demand is growing because cassava, yams, and sweet potatoes are essential, staple consumption goods.

A number of recent speculations in the literature suggest that rapid growth in one part of the world could actually impoverish other parts of the world. In particular, it has been said that rapid income growth in China or India may accompany declining productivity, causing these two countries to import huge amounts of food, thus driving world prices sky high and starving the rest of the world. We ran a scenario to test that hypothesis by sharply dropping production growth rates in those two countries. We did see large increases in imports, but only moderate increases in prices (see Figures 7 and 8). We did not find that rapidly increased demand in one part of the developing world could drive prices out of reach for the rest of the developing world, because world markets are quite responsive. Crop supply response still exists in the key exporting countries as well as in much of the developing world. So markets do work to absorb those kinds of rapid increases.

We all know that globalization is a hot topic, and there are many pros and cons to it that will be discussed in much more detail later. We ran a scenario to try to assess what the impact of agricultural trade liberalization would be, and we define that in terms of eliminating trade restrictions and agricultural



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

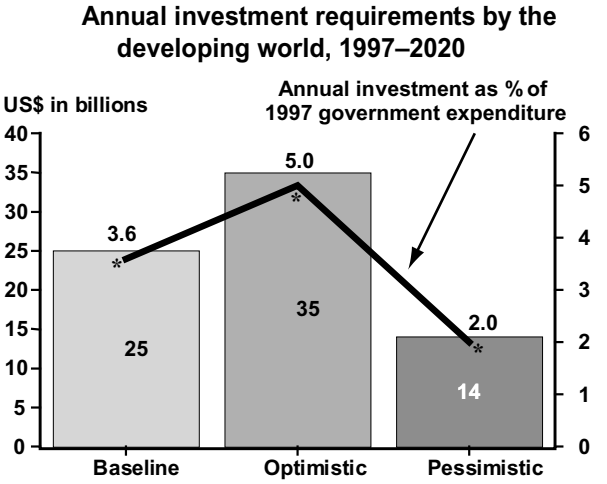
FIGURE 9

subsidies that are trade distorting in both the developed and the developing countries. We then estimated the costs and benefits to consumers and producers, and the tax savings resulting from removal of subsidies. We found very large net benefits, about $36 billion annually by 2020, from removing trade restrictions. The developing world would benefit substantially, receiving $22 billion annually from that amount. Sub-Saharan Africa itself would gain more than $4 billion a year, or 10 percent of the value of the commodities in the model. So, very significant benefits would accrue primarily from the removal of subsidies in North America and Europe.

Finally, let me return to the key message I want to convey: we really can do something about child malnutrition if we start now. At the beginning of my presentation, I laid out three scenarios for child malnutrition in 2020, depending on what policies and investments we pursue (see Figure 9). The baseline scenario showed 132 million malnourished children in 2020. An optimistic scenario showed 94 million malnourished children, and a pessimistic scenario increased the number of malnourished children to 175 million.

Figure 10 shows the annual investments that would be required in five key areas to generate these alternative scenarios: (1) education of women and girls; (2) clean water, health, and nutrition; (3) rural infrastructure; (4) irrigation and water resources; and (5) agricultural research. The baseline scenario would cost the developing world about $25 billion a year in investments.

You could save $11 billion if you were willing to make another 45 million children malnourished and hungry every night. But, if instead, governments, international agencies, NGOs, and others were more generous, an additional $10 billion would double the progress and nearly halve child malnutrition by 2020. Is $10 billion a year a big number? The line graph in Figure 10 shows these annual investments as a percentage of the total expenditures by developing-country governments in 1997. In the baseline it would mean spending only 3.6 percent of total government expenditures on those key investment areas. Increasing that to 5.0 percent is all that is needed to produce a much better outcome for children.



Source: Rosegrant et al. 2001. *Global Food Projections to 2020: Emerging Trends and Alternative Futures.* International Food Policy Research Institute, Washington, DC.

FIGURE 10

Another comparison makes this even starker. Ten billion dollars is less than one week of global military expenditures. By saving one week of military expenditures, we could reduce malnutrition for an additional 40 million children.

By saving one week of military expenditures, we could reduce malnutrition for an additional 40 million children.

We're faced with having sharply different worlds in 2020. There's still time to choose among these futures, but it is urgent that we act now. Pro-poor policies and investments in the key areas I've enumerated could reduce child malnutrition much faster. It's within the reach of governments, NGOs, international development agencies, and all of us to make a real difference if we begin to act now.

Discussion

The discussion resulting from Mark Rosegrant's presentation ranged from general questions on the underlying assumptions and track records of such projections to specific queries on the implications of a drop in the demand for meat and dairy products and on the impacts of climate change.

When a participant asked what nongovernment actors, such as those in the private sector and in research, can do now to influence food security, Rosegrant remarked that rapid economic growth in developing countries is not only good for people, it is good for business. The big customers for agribusiness firms or large farms in the United States or Europe are rapidly growing countries. In addition to the humanitarian or moral issues involved, it behooves the private sector to get more interested in issues of growth and hunger. In his closing, the Chair, Manfred Kern, added that the time is over for differentiating between public and private actors; the key is to develop technologies, in partnership, that are relevant in place and time. Achieving food security is not only a technical question, but also a problem of how to bring the message to the public. The Chair suggested that a youth conference on the topic of food security could lead to a breakthrough for further progress.

A participant expressed concern over the underlying assumptions for the projections and the mindset behind them. Rosegrant replied that the mindset issue is one of the primary goals of the Conference. Many analyses show that it is not overwhelmingly difficult to make serious progress, but there is a lack of political will to spend the money and to reform policies. When another participant expressed concern over the track record of projections like the ones presented in this session, Rosegrant pointed out that Alex McCalla and Cesar Revoredo have written a paper on the accuracy of such studies, which shows reasonably good performance (see McCalla and Revoredo, *Prospects for Global Food Security: A Critical Appraisal of Past Projections and Predictions,* 2020 Discussion Paper 35, IFPRI, 2001).

Since the most optimistic scenario presented projected almost 100 million malnourished children in 2020, another question concerned what investments would be needed to achieve the goal of the Conference—food security for all by 2020. Rosegrant responded that the process is not linear; after a while the investments no longer bring any gains. For example, one can only push access to clean water so far, and then everyone has it and there are no more benefits to be gained. Much more rapid economic growth and broad-based protection and help for the poor are needed, but it is difficult to work that into such an aggregate model.

When a participant asked how a substantial fall in the demand for meat and dairy products would affect the projections and whether such a fall in demand was likely owing to health or environmental considerations, Rosegrant answered that it would take massive taxes or behavioral education to discourage people in developing countries from eating more meat, if that was the policy goal. Although the argument might be that eating less meat would release cereals for consumption by people, analyses show that an attempt to reduce meat demand would in fact depress prices, drive cereal farmers out of business, and lead to less income growth in the developing countries. The Chair added that intake of vegetarian protein from soybean and canola could be increased in the face of a shortage of meat protein.

A participant raised a question on the pessimism of the cereal production projections, particularly in Sub-Saharan Africa, and asked whether the low numbers result from the policies chosen in those countries, investments of government resources, or environmental degradation. Rosegrant responded what is frightening is that the model assumptions were actually optimistic about production rates in Africa. Population growth is so high and overall economic growth so low, however, that agricultural productivity growth alone cannot solve the problem. Even with much increased investments in research, education, and health, production rates still do not rise quickly.

When a participant asked if the projections took account of decreasing production caused by climate change, Rosegrant replied that he and his colleagues are still working on bringing climate change into the model.

Other issues mentioned by participants throughout the discussion were the importance of microalgae as a source of protein and the increasing amount of arable land devoted to producing food for companion animals, such as cats and dogs.

Part 3

Emerging Forces

From Here to 2020

A. DEMOGRAPHIC, HEALTH, AND NUTRITION FORCES

Chapter 8

A World in Flux: Changing Population Profiles and Needs

Chair: H.-Jochen de Haas
Head, World Food Security and Rural Development, Federal Ministry for Economic Cooperation and Development, Federal Republic of Germany

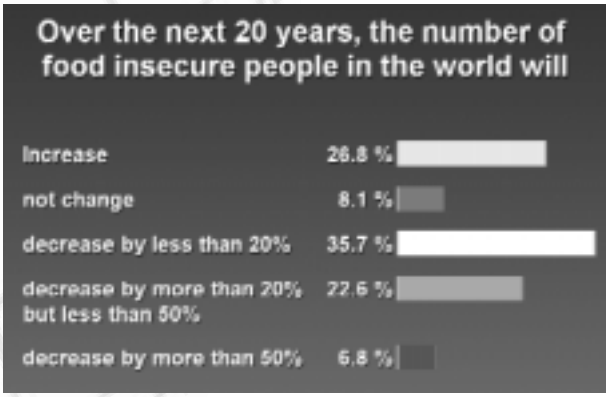
This session addresses one of the central issues influencing our overall thinking on how to achieve the goal of sustainable food security for all by the year 2020.

By far the majority of the participants in this hall—in an opinion poll—voted for a decrease of about 20 percent in the total number of hungry people by the year 2020, so I think we all have a certain amount of optimism looking into the future. The subject we are dealing with has tremendous consequences for the world's food needs and for the nutritional side of food security.

The twenty-first century is facing two main demographic changes. On the one hand, the population pyramid is changing. Increasing life expectancy and lower birth rates, as observed in the industrialized countries, are slowly becoming a reality in our partner countries too. That means fewer economically active people have to care for an increasing number of elderly people, with tremendous consequences for social security networks. On the other hand, the trend of increasing urbanization continues all over the world, creating enormous problems of adequate food supply, especially for the growing number of mega-cities. This trend goes hand in hand with the decreasing interest and investments in rural areas we have been talking about throughout the day.

From a nutritional point of view, it is most important to take into consideration that malnutrition in early childhood has detrimental effects on later life. It negatively influences learning capacity and physical development, with consequences for adult productivity and, therefore, economic development. Even more, there is increasing evidence that childhood malnutrition leads to an increased probability of acquiring chronic diseases in adult life. So it is important to consider food and nutritional security in a life-cycle approach.

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

Another important topic that has been mentioned before is changing food habits. Improving welfare leads generally to a growing demand for higher quality food, especially animal products.

And it is impossible to talk about trends and changes in food security and nutrition without mentioning AIDS. Thirty-six million people are currently living with HIV/AIDS, 25 million of them in Africa. The consequences for food security and nutrition are enormous. There is a continuous loss of productive segments of the population, and at the same time the disease is creating huge numbers of orphans and elderly people without adequate security nets.

Our distinguished speakers will no doubt give us enriching insights and indicate areas where concrete action can and needs to be taken.

Demography: John Bongaarts

Vice President, Policy Research Division,
The Population Council

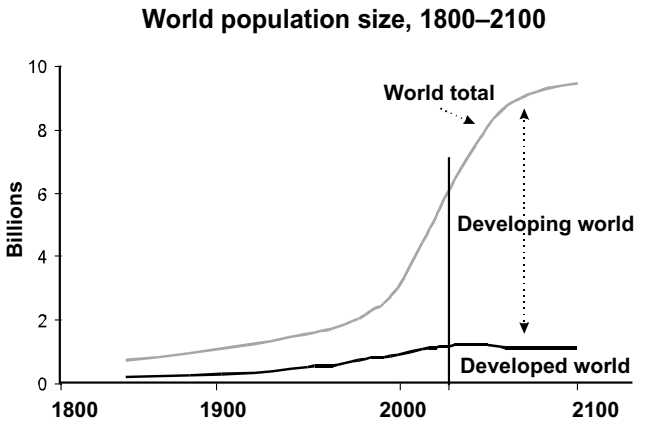
Around the world, populations are experiencing unprecedented demographic change. The best-known example of this change, of course, is the rise in human numbers. The population of the world today stands at 6.1 billion—3 billion more than in 1960—and in all likelihood, there will be 3 billion more people 50 years from now. This growth in human numbers has been and will be one of the principal causes of rising demand for food, water, and other natural resources.

But there are many other important demographic trends. Women are bearing fewer children. People are living longer and healthier lives. Populations are aging. An increasing number of migrants are moving from villages to cities and from one country to another in search of a better life.

I will not be able to cover all these topics, so I would like to suggest three for discussion today. I'll start with a brief overview of population growth trends, globally and regionally; then make a brief comment on urbanization; and finally, discuss population policy options.

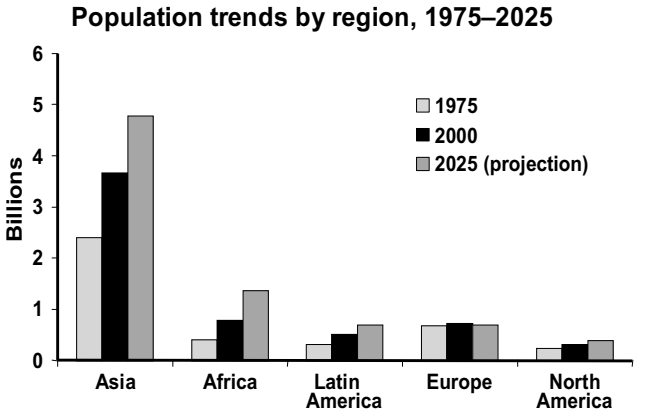
Let me start then with population growth. Figure 1 shows the long-range trend in world population from 1800 to 2000 and the projections from 2000 to 2100. World population stood at 1 billion in 1800 and grew slowly to 2.5 billion in 1950. Growth then accelerated, largely because of a decline in mortality, and today stands at 6.1 billion. All projections made by organizations such as the UN, World Bank, and others indicate that growth will continue, reaching about 7.5 billion in 2020 and about 10 billion eventually.

I'd like to make two points about this graph. First, essentially all of the future growth will occur in the developing world, that is, the poor regions of Africa, Asia, and Latin America. In contrast, in the developed world—Australia, Europe, Japan, and North America—population on average will remain close to its total today.



Source: United Nations. 1999. *World Population Prospects: The 1998 Revision.* United Nations Population Division, New York.

FIGURE 1



Source: United Nations. 2001. *World Population 2000.* New York: United Nations Population Division.

FIGURE 2

The second point I'd like to make is that we're still on the steep part of this curve. The past few decades have seen unprecedented increases in growth, about three-quarters of a billion per decade. This absolute increase will continue for one or two more decades before it slowly tapers off and eventually reaches zero some time later this century.

That is the global picture. Let's look at the regional trends. In Figure 2, I have given three estimates for each region: 1975, 2000, and 2025. Asia is by far the largest region. It had about 2.4 billion people in 1975. Today it stands at about 3.7 billion, and an additional billion people are expected in the next 25 years.

Africa is a much smaller region, but it is growing at a much faster rate. Today Africa has about three-quarters of a billion people. Its population has nearly doubled in the last 25 years and is expected to

increase at least 50 percent—about 500 or 600 million more people—in the next 25 years. And this is expected to happen even though this continent has been very seriously affected by the AIDS epidemic. AIDS has, in fact, eliminated population growth in a number of countries, including South Africa and Botswana. But the remainder of the continent continues to grow, although at a slower rate than would have been the case without the AIDS epidemic.

Latin America is a small region with moderate growth. The final two regions are Europe and North America. Europe has grown very little in the last 25 years and is expected to see a modest decline in the next 25 years. Thus its level will be roughly the same in 2025 as it was in 1975. North America is growing at a fairly rapid rate and will continue to do so for the foreseeable future.

So in the developed world, we have some areas, such as Europe and Japan, that see declines. North America and Australia are expected to see increases. Those pluses and minuses will more or less offset one another so that, on balance, growth will be near zero.

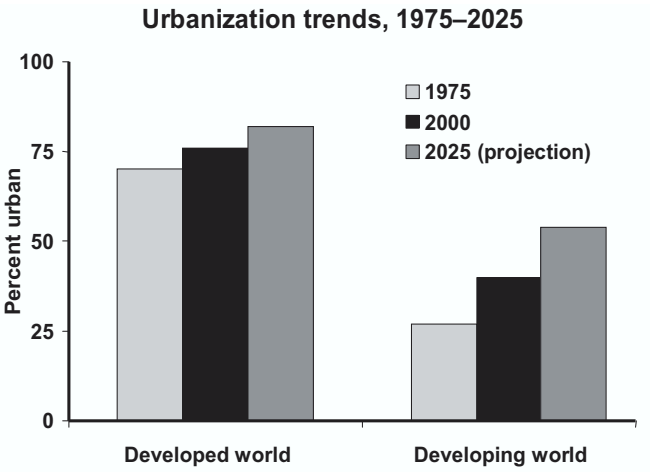
The growth that is expected in the developing world will have a number of adverse consequences. First, regarding the food supply, more people means less arable land per capita and less water per capita. Very high population densities in many developing countries make it difficult to expand the food supply, particularly in South Asia and in the Middle East.

Second are the well-known environmental effects: degradation of natural resources, soil erosion, water depletion, deforestation, and reduction of biodiversity as well as pollution of air, water, and soil.

The third area of impact is the economy. One effect of a large and growing population is competition for a limited number of jobs among many unemployed, and that keeps wages down. Low wages and high unemployment in turn contribute to poverty, inequality, and slow economic growth.

The final area of impact is on the governmental

...the next 3 billion people added to the planet are mostly going to live in cities in poor countries.



Source: United Nations. 2000. *World Urbanization Prospects: The 1999 Revision*. New York: United Nations Population Division.

FIGURE 3

level. Many governments are unable to cope with very rapid population growth, and as a result, investment in education, health services, and infrastructure lags.

These adverse effects make it important to address rapid population growth, and at the end of my presentation, I'll come back to policy options.

I want to turn now to the second topic: urbanization. Urbanization, of course, is a natural result of economic development. People move from rural areas, where agriculture is the dominant activity, to the city in search of new jobs and a better life. You've seen this progress throughout the world. As Figure 3 shows, in the developed world the level of urbanization was already at 70 percent in 1975; it is 75 percent today, and it continues to go up slowly.

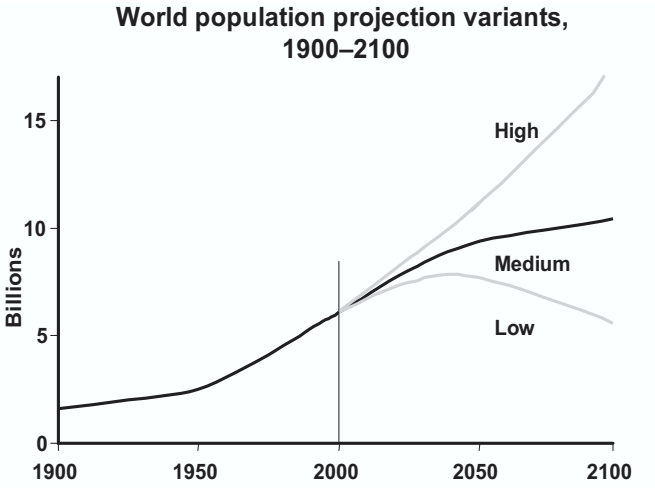
In contrast, in the developing world only a quarter of the population lived in urban areas in 1975. The number has risen to about 40 percent today and is expected to reach nearly 55 or 60 percent in the next 25 years. So urbanization is moving at a very rapid pace in the developing world. In fact, migration from the villages to cities is so rapid that the UN now expects that the population in rural areas will stop growing. In the past 50 years, both rural and urban populations have grown, but the UN now expects that the rural population will level off and stay close to its current level, while the

urban population will continue to grow at an exponential rate.

These trends have an important implication: the past several billion people that were added to the planet were added in both the developed and the developing world, in both rural and urban areas. In the future, the population of the developed world will stop growing, and the population of the rural areas of the developing world will soon stop growing as well. That means the next 3 billion people added to the planet are mostly going to live in cities in poor countries. And most of those cities don't have the resources or the ability to absorb this large influx of people. Many of these people will, therefore, end up living in slum areas with poor housing and limited services and infrastructure.

I'll close with a quick comment on policy options. We can look for solutions in three areas. The first of these is to strengthen family planning and reproductive health programs. Many women in the developing world don't have access to contraception, and as a result about 40 percent—that is, about two out of five—pregnancies are unplanned or unwanted. Many women have more children than they want. The solution is to provide contraceptive services and information to let women implement their family planning preferences.

The second area is investment in human capital. Investments are particularly needed to improve girls' education and the status of women. Wherever we look, we find that women with a high level of education have fewer children and are better able to control their fertility. The third option is to delay childbearing, thereby reducing population momentum. Addressing the contraceptive needs of adolescents is a particularly important step because many adolescents are now getting pregnant when they don't want to. If you can keep girls in school longer and provide them with jobs, they will have fewer children and they will have them later in life. That will benefit the women directly, of course, and will have societal benefits because of the larger demographic implications.



Source: United Nations. 1999. *World Population Prospects: the 1998 Revision.* United Nations Population Division, New York.

FIGURE 4

Implementing these policies can have a large impact on future population growth. Figure 4, which plots three UN projection variants, suggests how large that impact might be. The medium variant is the one I have discussed so far, which sees population growing from 6 billion today to about 10 billion in 2100. The high variant sees population growing to 17 billion, and the low variant to 6 billion. What I hope we can achieve is progress on the policy options I suggested, in which case we will be closer to the low than the medium variant. That in turn will make it easier to meet the rapidly growing demand for food and will reduce the environmental impact of human activities.

Nutrition: Lawrence Haddad

Director of the Food Consumption and Nutrition Division, International Food Policy Research Institute

I have a confession to make. I used to think that Bonn was a place built by government for government. That, of course, is a total myth. The written history of Bonn goes back at least 2,000 years. Myths are seductive, but they crowd out facts. In the next 10 minutes, I want to bury six nutrition myths—myths that I believe are stopping us moving from dialogue to action.

Malnutrition is not just about food deprivation.

Six Nutrition Myths

- **Myth 1:** We are making significant progress in reducing malnutrition.
- **Myth 2:** Nutrition has little to do with economic growth and poverty reduction.
- **Myth 3:** Increases in income will quickly lead to reductions in malnutrition.
- **Myth 4**: Malnutrition represents a parental failure.
- **Myth 5:** We don't know what to do.
- **Myth 6:** It's too expensive to achieve a quantum improvement in child nutrition trends.

I wish it were that straightforward, but it's not. If for some monstrous reason you wanted to create a malnourished child, how would you go about it? First, start with the smallest possible mother. That means she has likely been malnourished, and any food that she takes in during pregnancy will go to meet her own needs before that of the baby growing inside of her. Second, delay newborn breast-feedings or don't start at all. That deprives the baby of the best possible food—breast milk. If you use a bottle, make sure the water is dirty. That will guarantee infection, which increases nutrient requirements but also diminishes the body's ability to actually absorb nutrients. Third, keep the child away from health and vaccination clinics. Perpetuate infection. Fourth, give no food to a child with infection; give no water to a child with diarrhea. Perpetuate misinformation. Fifth, make sure the mother has five other children to take care of, no help from her partner, and a job outside the home. She won't be able to give any care to her children. Finally, go back to step one. Unfortunately, malnourished baby girls grow up to be malnourished mothers who give birth to malnourished babies, and so the cycle goes on. Thus it is really an unholy trinity of deprivations—deprivations in food, care, and health—that is responsible for malnutrition.

Given that three types of deprivations have to occur in some combination to create malnourished children, how easy does the world find it to actually do this? Unfortunately, the world finds it pretty easy to generate malnourished children. Every second a child becomes malnourished. That's 600 during the course of my talk alone.

Are we making significant progress in reducing malnutrition? We've heard words like "mediocre progress," "marginal progress." Actually, we're making terrible progress. If you look at real data, trend data from the mid-1980s to the mid-1990s, you will see that the myth of progress is myth number one. The data show that—for the 58 developing countries that comprise about 80 percent of the developing world's population—there were 137 million malnourished, preschool-age children in the mid-1980s and 131 million in the mid-1990s. Those are real data, not projections, not estimates. At that simple trend rate, it will be 2094 before we halve the number of malnourished preschoolers. We won't be around in 2094, and given this terrible performance, it's probably just as well.

The rights of millions of children are being violated day by day. That is a humanitarian crisis. Unfortunately, it is a silent one. It doesn't make the headlines like many other crises do. But how can these so-called soft arguments reach those who only care about dollars, euro, and yen?

Surely, nutrition has little to do with economic growth and poverty reduction. Well, Mr. de Haas has already indicated that that is myth number two. Let me take education as one pathway linking nutrition and the economy. Common sense and hard empirical evidence tell us that malnourished children enter school later and learn less, and they keep on learning less. Their ability to learn is impaired throughout their lifetime. Their ability to earn is impaired throughout their lifetime. Their livelihood options are severely curtailed. They are not only physiologically maimed and physically maimed by malnutrition, they are economically maimed as well.

The literature contains some estimates about how this all adds up in terms of losses in GDP. GDP losses due to malnutrition are estimated to range between 2 percent and 6 percent, year in, year

out—a steady drumbeat of GDP losses. Over a decade like the 1990s, those losses are cumulatively much bigger than the losses suffered by many of the Asian countries during the Asian financial crisis.

So we have a real problem. Maybe there is an economic solution. Surely increases in income will quickly lead to reductions in malnutrition; we just need to worry about broad-based economic growth. Right? Wrong. That is myth number three.

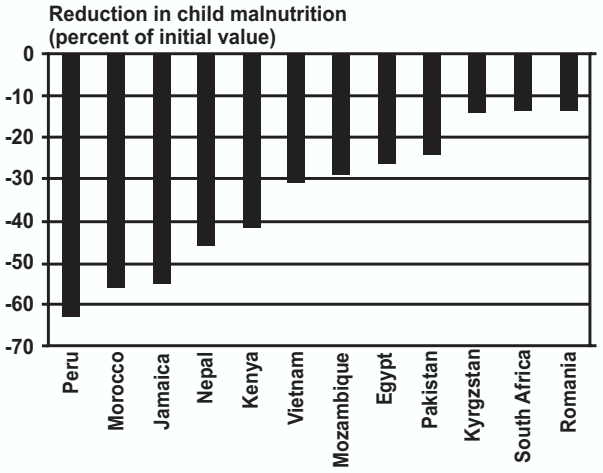
We did some projections asking the question "Over a 20-year period, from now to 2020, can a 2.5 percent growth rate in real per capita annual income halve child underweight rates?" Of the 12 countries in Figure 1, for only 3, Morocco, Peru, and Jamaica, were we able to project a halving of malnutrition rates. A growth of 2.5 percent sustained over a 20 year period is a wonderful rate of economic growth, but it only does the business of halving malnutrition by 2020 for 3 countries.

Something else needs to be done. I'm not saying income growth is unimportant. In fact it is critical. And it must be driven by investments in agriculture, irrigation, health, and all the things Mark Rosegrant talked about—especially in the least developed countries and in the least developed regions of those countries. Still, something else clearly needs to be done about malnutrition. That being the case, shouldn't parents have to do something about it? Surely, malnutrition represents a parental failure. Not surprisingly, that is myth number four.

You and I know parents who are not particularly good parents. They leave something to be desired. But here I'm talking about people living on a dollar a day or less than a dollar a day, less than two dollars a day. That's less than what it costs to buy a bottle of water at this Conference. These people are already spending 70 percent of their income on food. They simply don't have enough money to purchase nutritious food for their kids, private health care, private education, private child care. This is not so much a parental failure as it is a market failure.

We need some kind of public action in combination with private action and a whole range of other stakeholders acting. But we don't know what

Decline in child malnutrition due to 2.5 percent annual growth in per capita income: 1990s to 2015



Source: Haddad, L., et al., 2002, "Reducing Malnutrition: How Far Can Income Growth Take Us?" Forthcoming FCND discussion paper, IFPRI.

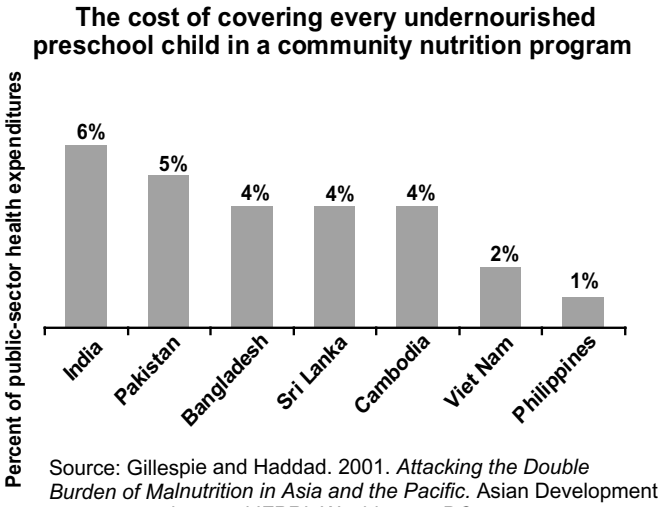
FIGURE 1

to do. If we knew what to do, we wouldn't be in this mess in the first place—myth number five. We do know what to do. We know where to invest. We don't quite know which priorities and which circumstances, but that's for processes at the local level and the national level to sort out. We know what to do. We know where to invest: agriculture, education, health, infrastructure, irrigation.

In more immediate terms, we have a very good list of highly cost-effective interventions in the area of nutrition. Why aren't they working? Well, the real problem is that we're having trouble intensifying those interventions to the level at which we would see significant improvement in reducing child malnutrition rates. In other words, it's too expensive to do this. That is myth number six. And it, too, is wrong. These interventions are not too expensive.

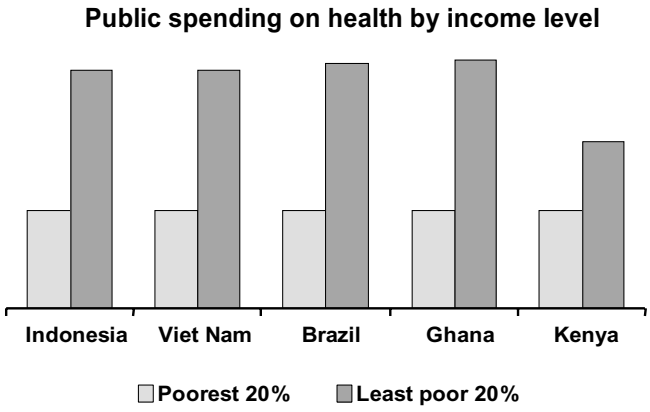
Let me give you one such example: a community nutrition program. It is community-led; therefore, communities are empowered by the process. A lot of positive externalities that go way beyond nutrition are generated. These kinds of programs integrate food, care, and health in a way that

...malnourished baby girls grow up to be malnourished mothers who give birth to malnourished babies, and so the cycle goes on.



Source: Gillespie and Haddad. 2001. *Attacking the Double Burden of Malnutrition in Asia and the Pacific.* Asian Development Bank, Philippines and IFPRI, Washington, DC. (Adapted from Mason 1999).

FIGURE 2



Source: World Bank. 2000. *World Development Report 2000–01: Attacking Poverty.* Washington, D.C.

FIGURE 3

food, care, and health in a way that you don't see often. Nutrition has become very medicalized, with micronutrient programs that are vertical but don't say anything about food or connect to the food system in any way. In contrast, interventions such as community nutrition programs are connected to food, care, and health. They are also proven winners. They are largely responsible for the declines in malnutrition in Thailand during the 1980s and 1990s.

How much would one of these programs cost if it were to cover every malnourished child in the seven countries in Figure 2? It would require between a 1 percent and 6 percent increase in current levels of public-sector health expenditures. Is that a lot? Bear in mind that the increase would cover every malnourished child. Still, is a 6 percent increase a lot? Those of you in charge of budgets know that it can be difficult to increase your budget by 1 percent, let alone 6 percent. But you also know that there are opportunities to do so. Fortunately, there are opportunities to intensify nutrition-improving actions.

GDP losses due to malnutrition are estimated to range between 2 percent and 6 percent, year in, year out—a steady drumbeat of GDP losses.

In rich countries, official development assistance can be targeted more to least developed countries. In developing countries, there is plenty of scope for reforming large but ineffective nutrition programs. For example, universal food subsidies that are captured by rich households can be redirected to more needy sectors. And much can be done to make health-sector spending more sensitive to the needs of the malnourished. Take a look at Figure 3. The rich households in each of the five countries capture a much larger percentage of public health expenditures than the poorer households, the 20 percent at the bottom end of the distribution.

I've talked a lot about myths. Let me review the reality. There is bad news and good news. The bad news is that there is one newly malnourished child every second. Progress is scandalously slow. Income growth is critical but insufficient. Markets, not parents, are failing children. The good news of the reality check is that when children grow, the economy grows. We know what to do to make a huge dent in malnutrition. It's cheaper than we may think. There are financing opportunities.

How do we seize resources and opportunities to intensify action? We need to become more political, more street-wise, more strategic. We need to use the new development and aid architecture for nutrition. We need to use the poverty reduction strategy processes, sector reform mechanisms, and WTO rule changes, and even tap into the energy of global civil society to generate more capacity and more

resources for nutrition. We also need to become better salespeople for nutrition.

We know that good nutrition is important in slowing down population growth. It is important in slowing down the progress of the HIV virus from infection to full-blown AIDS. And it is important for delaying the onset of diet-related chronic diseases.

In conclusion, I look forward to the day when the only nutrition myth we talk about is that mass malnutrition exists, the reality being that it doesn't. I hope that day is well before 2020. I believe it can be. The choice is ours.

Dietary Changes:

Susan Horton
Professor of Economics and Chair of Division of Social Sciences, University of Toronto

So far we've been talking about undernutrition. I've been asked to talk about the other side of malnutrition, which occurs when households—generally in developing countries, particularly in urban areas—consume too much of the wrong kinds of foods and the consequences that can have for their health. I hope to convince you that the two aspects of malnutrition are not unrelated. When we undertake policies to deal with undernutrition, we should also be planning for the day when diseases related to "overnutrition" become important. We need to ensure that the policies we set in place to solve one problem do not at the same time sow the seeds for future problems.

First, I would like to talk about trends in diet and how changes in diet are associated with changes in mortality and disease patterns. Second, I will talk about the costs of the noncommunicable diseases that are related to diet. And, finally, I will discuss the policy options.

The data I am using to illustrate the trends here are for two very large developing countries: China and India. These countries serve as examples, first, because they're such big countries and, second, because they represent quite well the trends going on in Asia—

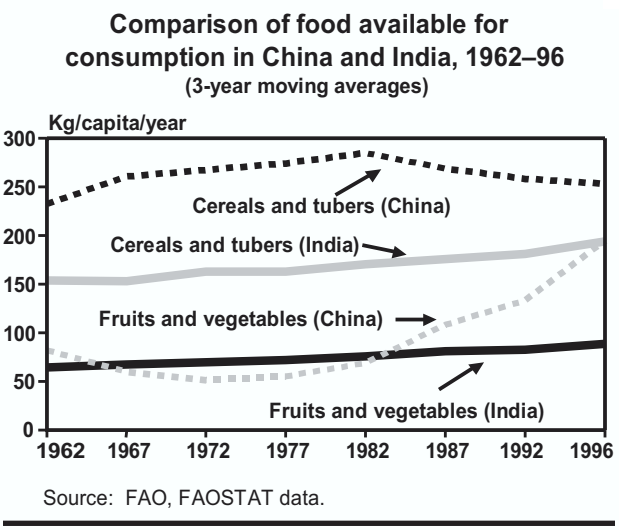


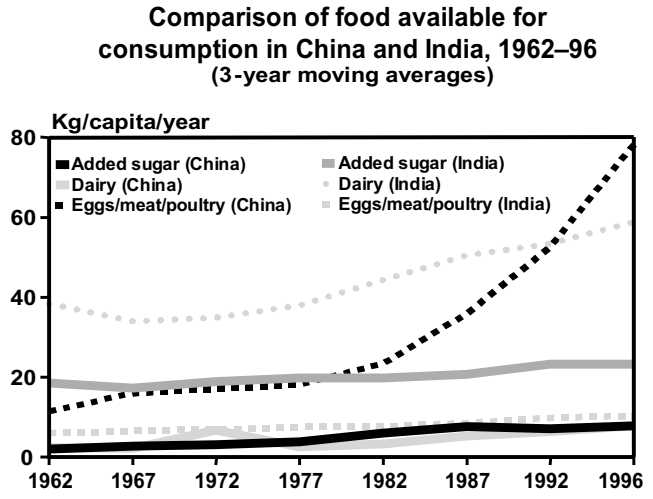
FIGURE 1

China representing the middle-income trends in Asia, and India representing the low-income trends in South Asia. The data also reveal interesting differences between trends that are not related to income but show, instead, the importance of different food traditions and food habits in different countries.

In Figure 1 you can see positive trends: increasing availability of food, increasing diversity of food available for consumption, and middle-income countries having more food available than low-income countries. Thus the lines for China are higher than those for India. Figure 2 shows some additional aspects of dietary diversity. Again, increasing diversity is evident over time; and China is much farther ahead than India in terms of the increasing availability of such foods as meat products and eggs over time.

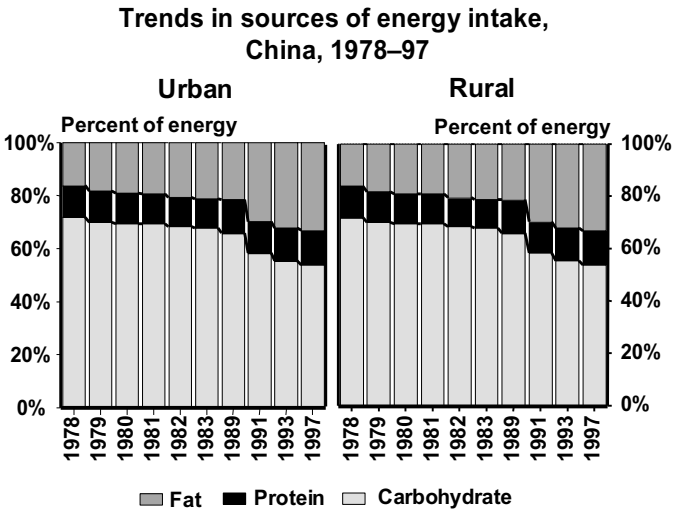
From Figure 2 we also begin to get some idea of the problems inherent in improved diets. For example, consumption of added sugar is already considerably higher in India than in China, and it is increasing. Likewise, dairy consumption in India is quite high and increasing. Diet-related diseases, such as adult onset diabetes, are already beginning to emerge in the urban areas in South Asia. These trends are very interesting and perhaps even cause for concern.

These dietary trends can be analyzed another way to show how the source of energy is changing over the course of economic development. In



Source: FAO, FAOSTAT data.

FIGURE 2

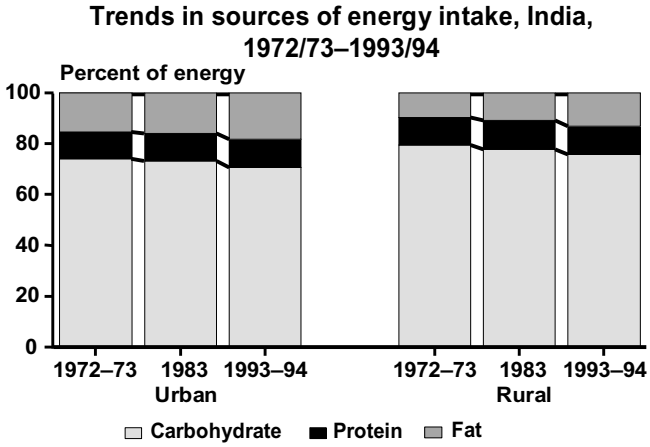


Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001. "Diet-related noncommunicable Disease in China and India: The Economic Costs of the Nutrition Transition." *Nutrition Reviews* 59: 379–390.

FIGURE 3

Figure 3, for China, one of the things to note is the increase in the proportion of energy coming from fat in the diet. By 1997, in the urban areas of China, we see maybe as much as 30 percent of energy coming from fat. Remember that health guidelines for developed countries suggest that not more than 30 percent of dietary intake should come from fats because of the health consequences.

India is further behind in this transition and has perhaps less to worry about as yet (see Figure 4). Even so, in the urban areas, some of these troubling trends are beginning to show themselves.



Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001. "Diet-related Noncommunicable Disease in China and India: The Economic Costs of the Nutrition Transition." *Nutrition Reviews* 59: 379–390.

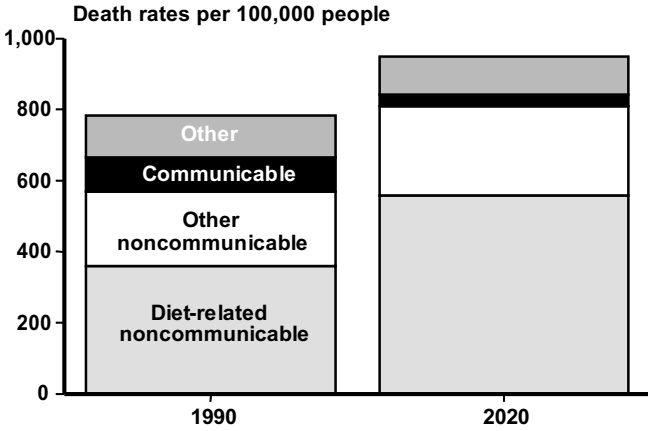
FIGURE 4

Now let us tie those data to the trends in mortality. Figure 5 represents the trends for four groups of causes of death in China between 1990 and 2020. Diet-related noncommunicable diseases include heart disease, stroke, diabetes, and some of the cancers that are now known to be diet-related. The figure clearly shows the sharp rise in the proportion of mortality attributed to diet-related noncommunicable diseases. Those diseases already account for close to half of the total of all mortality in China, the remainder being other noncommunicable diseases; communicable diseases such as infections and parasites, which are diminishing rapidly in the course of development; and other diseases and causes of death. Death rates in China are actually going up as the population ages because these are crude death rates, i.e. not adjusted for age composition of the population.

For India, the trends look a little bit different (see Figure 6). Death rates are still coming down as infectious disease is slowly being conquered. Nonetheless, you see the same trend: the increase in the proportion of diet-related noncommunicable diseases.

I want to turn now to the costs of undernutrition and the costs of diet-related noncommunicable diseases related to overnutrition. Clearly the most important costs are the human ones. Child mortality, or premature mortality, is the most important, and others at this

Mortality trends in China, 1990 and 2020



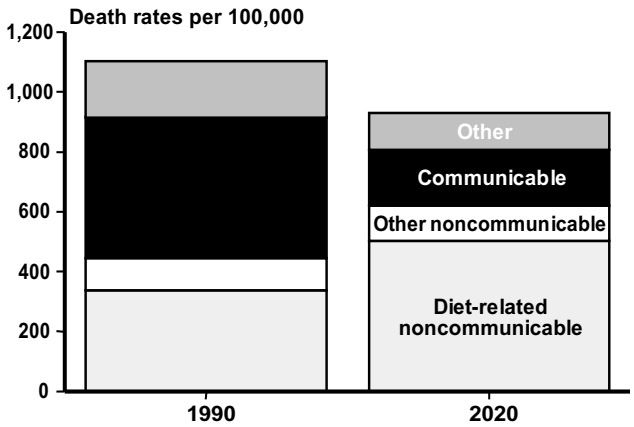
Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001. "Diet-related Noncommunicable Disease in China and India: The Economic Costs of the Nutrition Transition." *Nutrition Reviews* 59: 379-390.

FIGURE 5

Conference have given statistics for that. But dealing with undernutrition also makes good economic sense.

The costs of malnutrition are significant and clearly much larger in low-income countries. If we're lucky and malnutrition drops, these costs will tend to go down over time. But, as we succeed in reducing the costs of malnutrition, there will potentially be an increase in the costs associated with diet-related noncommunicable diseases. These are costs of premature mortality and lost work output, and also costs to the hospital system. These costs are going to rise significantly over time as the population becomes more affluent.

Mortality trends in India, 1990 and 2020



Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001. "Diet-related Noncommunicable Disease in China and India: The Economic Costs of the Nutrition Transition." *Nutrition Reviews* 59: 379-390.

FIGURE 6

Human costs of diet-related noncommunicable disease, 1995 and 2025

	China		India	
	1995	2020	1995	2020
Millions of deaths/year	2.6	7.6	3.0	4.9
Percent of all deaths	41.6	52.0	31.6	43.3

Source: B. Popkin, S. Horton, S. Kim, A. Mahal, S. Jin. 2001. "Diet-related Noncommunicable Disease in China and India: The Economic Costs of the Nutrition Transition." *Nutrition Reviews* 59: 379-390.

TABLE 1

In China, for example, the average hospital stay for someone with cancer costs more than the annual per capita GDP. In India, the hospital stay associated with heart failure costs more than annual per capita GDP.

The human costs of diet-related noncommunicable diseases are also large and will rise significantly over time (see Table 1). We need to think about this important health policy imperative now and act before it is too late. But how should we go about it? Should we first conquer undernutrition and then start thinking about diseases related to overnutrition? No, we can't do that. We already know that in households in South Asia, in India, the same household may contain one malnourished individual and another individual who is overnourished—that is, whose diet is inappropriate for the kinds of work and activity patterns the individual is undertaking.

We also know from some medical work by David Barker that babies who are born to mothers who are very thin or stunted are in some sense programmed for a life of deprivation. If they then migrate with their families to an urban area and become richer and face a more affluent urban diet, they are much more susceptible to chronic diseases later in life than the average individual. So in the Asian countries where economic growth is

People who were stunted as babies become very susceptible to the diseases of affluence once they become older.

occurring rapidly, the problem is compounded. People who were stunted as babies become very susceptible to the diseases of affluence once they become older.

What kinds of policies should be adopted? Are they a lot different from the policies that we're undertaking to reduce malnutrition? No. I think they are part and parcel of the same thing. To reduce malnutrition, we need integrated food and nutrition plans, and those also should take account of overnutrition, that is, consumption of the wrong kinds of foods.

When we think about agricultural policy to reduce undernutrition, we should be conscious of potential effects on older adults and chronic disease. Quick fixes, such as subsidizing oilseeds, may be good for malnutrition, but they sow the seeds of later problems. When we deal with preventive health care, such as community nutrition programs, we should not only deal with undernutrition but combine that with health promotion—teaching people about healthy diets and appropriate exercise patterns.

HIV/AIDS:
Gabriel Rugalema

Senior Policy Advisor, United Nations Development Programme's Regional Project on HIV and Development for Sub-Saharan Africa

I have been given the very difficult task of talking about HIV and AIDS. It is not only a new problem, but it is also immense. Let me start with these simple and difficult questions: Why worry about HIV/AIDS and why worry now?

We heard this morning from different speakers that close to 40 million people worldwide have HIV and AIDS, of which 25 million are in Africa. If we assume that 20 million of those are adults, and each of them has five dependents, we get 100 million people affected by AIDS. Then, if we still use the number of 800 million hungry people, we know that one out of eight hungry people is affected by AIDS. That is not a small proportion. If we add the numbers from Asia, to where the wind of AIDS seems to be blowing, the proportion might double. So we have a huge problem on our hands.

...we know that one out of eight hungry people is affected by AIDS.

How does HIV and AIDS relate to food security? The relationship is bi-directional. Vulnerability and food insecurity feed into the risk behavior that drives the HIV/AIDS epidemic; and the impact of HIV/AIDS exacerbates food insecurity, which again feeds into risk. Conversely, food security might help cut into the vicious cycle and play a role as a social vaccine for HIV prevention and control.

Consider a typical household in Lesotho or Kenya or Burkina Faso: food insecure, resources contracting. A man leaves for town. It could be a mine in South Africa. It could be a commercial farm in Ivory Coast. It could be a commercial sugarcane plantation in Kenya. He goes there to find employment to augment his family's income. But the income earned through sale of his unskilled labor is very small, so he doesn't remit that much money. And because he doesn't go home all the time, he finds a consort, contracts HIV, falls ill from AIDS, and his remittances cease to flow. That means his household begins to experience economic difficulties. He finally dies and the money ceases entirely. The man leaves behind orphans and a widow or widows. The widows later develop AIDS and die. The cycle of household impoverishment goes on. That is the relationship between food insecurity and AIDS I wish to show.

People have been asking, Is there evidence that HIV/AIDS is related to food insecurity and general household impoverishment? Yes, there is evidence. In rural areas we have found effects of HIV/AIDS on labor and labor time, mainly having to do with caring for the ill and frequent funerals. The microeconomic environment is destroyed when households have to pay to have people in hospitals for a protracted period of time. In much of rural Africa there is no formal insurance, and money is always very limited. So people have to sell their assets to have their kinsmen treated in hospital.

As a consequence of the epidemic there are shifts in farming patterns and a high dependency ratio. Thus HIV/AIDS affects cash income, both in terms of earning and expenditures, as well as the economic base necessary for the reproduction of households.

The bottom line is that HIV/AIDS intensifies poverty, and poverty fuels risky behavior. To me, this is not a belief. I know it. I have seen it.

The bottom line is that HIV/AIDS intensifies poverty, and poverty fuels risky behavior.

What then can we do? How can we challenge this challenger? First, let me restate that the role of food security in shaping behavior lies in strengthening the immune system as Lawrence Haddad has already noted. Good nutrition provides resistance to infections, including opportunistic infections; food security ensures less physical and mental stress, thus strengthening social cohesion and reducing risky behavior. So food security has a role to play in addressing the HIV/AIDS epidemic.

What interventions are possible? I see interventions at three levels. One is at the technological level, in terms of improving both the rural and urban environments so that people have secure livelihoods. For example, in agriculture, we could talk about genetic resources. People have been campaigning against genetic modification, but I think many things we do in agriculture (that is, crop production) have some connection to genetic modification. Genetic modification that would enable food insecure families to put food on the table is certainly worth it. This is an intervention at the farming system level.

The second level of intervention would involve building the capacity of communities and households to bolster economic security through various social safety nets, such as creation of employment and provision of education for orphans.

The third level is the macrolevel intervention. This would involve nation-states and the international community taking deliberate action to address factors that engender vulnerability to HIV/AIDS. If we agree that vulnerability enables HIV transmission, and if we agree that vulnerability is generated by the macro-, meso-, and microlevel social, political, and economic environment, the challenge of addressing HIV/AIDS lies at the macrolevel too.

Let me conclude by saying that the consequences and threats of HIV/AIDS on food security are real. Food security could play a significant role in stabilizing the situation and reducing the vulnerabilities of the population to HIV/AIDS. To achieve food security for all by 2020, we need to seriously address the impact of HIV/AIDS on food security in the broader context and at the various levels (micro, meso, and macro) of society.

Discussion

The lively discussion centered on four key areas: HIV/AIDS, food and nutrition, population movement, and the effects of conflict.

Participants raised several issues on HIV/AIDS. Asked for more information on the demographic impact of HIV/AIDS on Africa, John Bongaarts responded that before the

epidemic surged at the end of the 1980s, Sub-Saharan Africa had the highest population growth rate of any region in the world—roughly 3 percent per year, which represented the difference between the birth rate and the death rate. The AIDS epidemic has caused massive mortality—about 3 million deaths per year. Although the epidemic varies from country to country, it is largest in southern Africa, particularly South Africa, Botswana, and neighboring countries. In those countries, the epidemic has caused a quadrupling of mortality. The birth rate and the death rate are now equal, bringing the population growth rate to zero. In northern and western Africa, however, the epidemic is doubling the death rate and thus only partially affects the population growth rate. These countries, Bongaarts noted, face problems associated with both the epidemic and continued population growth.

When a participant inquired about the added impact of tuberculosis and dengue fever on food security, Gabriel Rugalema answered that HIV drives these other diseases, and if these diseases are taken in combination then the impact on food security is even more serious. Another participant asked about the relationship between HIV/AIDS and poverty, pointing out that HIV/AIDS affects mostly those who are a little better off and not the poorest of the poor. Rugalema responded that two forces are at work. First, HIV/AIDS is not equally distributed. Second, even if those who are a little better off are most affected by HIV/AIDS, their economic and social roles within their villages or communities means that the economic status of the entire village or community declines. A participant added that the rich are at fault for patronizing those poor who engage in risky behavior, such as prostitution and migration, because of inequalities in income and gender.

The issues raised by participants on food and nutrition were wide ranging. A participant asked, "If the world produces enough food, what are the bottlenecks preventing it from getting to the people that need it?" In response, Lawrence Haddad described four types of access related to food security. The first is physical access—food has to get to local markets before people can purchase it. The second is economic access—people need enough purchasing power to obtain food. There are also social access problems, such as when women and children get too little food at the household level, and physiological access problems, such as when a child gets food but cannot take in the nutrients because of diarrhea.

A second question to Haddad was whether any case studies showed the relationship between nutrition for children and their performance later in life. Haddad replied that there are two sets of case studies. One relates the nutritional status of adults to improved work performance, particularly for heavy, manual, labor-intensive types of work. The second is in the nutrition literature, where case studies link the impacts of feeding to cognitive achievements, which can then be linked to labor force earnings through the standard labor force relationships.

Other nutrition issues mentioned included globalizing diets and overnutrition. In response to a participant's comment that the process of globalization leads to the opening of markets to cheap, western foods and can lead to the loss of a healthy traditional diet, Susan

Horton pointed out that the flow of globalization goes both ways, and traditional foods have been adopted in the West as well. Although globalization may make it difficult to keep a traditional diet, not all traditional diets are healthy. In response to the discussion, Haddad reiterated that the best way of preventing overnutrition is to invest in preventing undernutrition, because investments made now pay off 40 years from now by delaying and minimizing the onset of chronic diet-related diseases such as coronary heart disease, diabetes, and hypertension.

Two issues raised on population movement were urbanization and international migration. A participant asked for the source of the projections on population growth and urbanization, wondering the following: If a majority of the population in countries such as India and China is in rural areas and there is a global recession, would the population not likely be more rural than urban? Bongaarts explained that the projections in his presentation were based on UN projections. The projections are made by looking at the birth and death rates in both rural and urban areas and adding the effects of migration from rural to urban areas, which is so rapid that natural growth is offset by migration and absorbed into the urban areas. Therefore, rapid urbanization is still a plausible projection.

Another participant made a comment about international migration between developing and developed countries and its impact on food security. When looking at the environmental, economic, and political factors, it is poverty that pushes people out of developing countries. In response, Bongaarts stated that international migration has three effects on food security. First, the food security of the people who are migrating, for example from Sub-Saharan Africa to Europe, will in general go up. Second, those migrants will often send remittances home, so their families will benefit. Third, if the flow of migration is large enough, it reduces population pressure in the sending areas. The third effect is relatively small, he noted, because the flow of migrants from the developing to the developed world is small relative to national population growth.

A last key area of discussion was the effect of conflict on population. Bongaarts commented that although war has obvious effects on migration and death rates, there is also credible, albeit controversial, literature indicating that population density can lead to conflict. Rugalema added that civil conflicts have an effect on food security in that they disrupt normal production, but they also have an effect on disease. In the cases of Liberia and Lesotho, both soldiers and migrants were a large percentage of those with HIV. The impacts of civil conflicts on disease, population movement, and agricultural production consequently have impacts on food security.

In closing, the Chair, H.-Jochen de Haas, acknowledged that given the difficulties and additional factors coming into the picture throughout the session, the target of the Conference is demanding. Therefore, it is crucial to act in a comprehensive way with broad-based solutions to achieve the target of sustainable food security for all by 2020.

B. ECONOMIC FORCES

Chapter 9

What Productive Resources Do the Poor Really Need to Escape Poverty?

Chair: Christian Friis Bach

Associate Professor of International/Development Economics, Royal Veterinary and Agricultural University, Denmark, and former Chairman of the Board, Mellemfolkeligt Samvirke

Achieving the 2020 target of sustainable food security for all will be a hard struggle because the struggle is not about science and knowledge. It is about power and political will.

In a world with global and local budget constraints, this has a lot to do with how to redistribute existing resources toward the poor. Fifty years ago, in the early days of development economics, redistribution was seen as a barrier to economic growth. Today we face a quite different and very positive story. There is increasing evidence that, when it comes to economic growth, countries with more equality—countries that do redistribute—perform better than countries that do not. So it pays to invest in poor people, and it pays for all. Nonetheless, inequality is increasing.

Redistribution is also about knowledge and technology. Information technology gives us new possibilities for distributing knowledge. But global intellectual property rights instead lead to new ways of controlling it. This is a problem.

Redistribution is, as well, about the balance between agriculture and industry, industrialization versus agricultural development—again, one of the very old debates in development economics.

The dilemma is that, while we know that we need to invest a lot more in poor people living in rural areas in poor countries, the aid and budget allocations move in the opposite direction. So knowledge and facts are not enough. It is a matter of power and politics. Who gets the resources and where should they go?

Keynote: Michael Lipton

Research Professor of Economics, Poverty Research Unit, Sussex University*

I'm going to make four points.

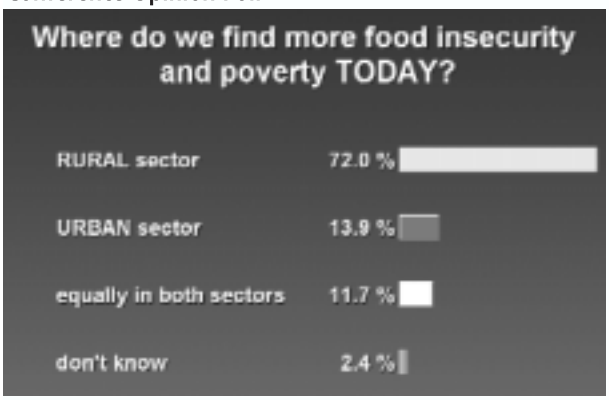
First, we need to address a paradox. A large majority of the world's poor is rural; indeed, a majority is agricultural. We all agree that poverty reduction is what development is about. It seems to follow that development resources would be directed more and more to agriculture and the rural sector, where the poor are. Yet for 13 years the reverse has been true. Aid to agriculture has collapsed, and the poverty strategies of developing countries make little mention of agricultural and rural development as sources of poverty reduction.

Second, I'm going to look at the role of the state in getting more and higher-productivity resources to the rural poor. Recent fertility declines open a demographic window of opportunity for appropriate state action in this area. However, a number of things make it difficult to get adequate employment and production in rural areas to poor people. Among those are the squeeze on rural water supply and the sharp slowdown in the rate of improvement of crop seeds. It is to these areas that state action needs to address itself.

Third, from the experience of developing-country individuals and governments, the International

* Summary note included in Appendix 3.

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

Fund for Agricultural Development (IFAD), and other agencies, we've learned a great deal about how institutions can be run by, participatory for, and beneficial to local people. Development is less top-down than it used to be, partly because we've learned that participation is efficient. Yet just as we learn about such software, the hardware fails us. Yield growth slows down. There's a water squeeze. Land reform stops. How can we address that problem?

Finally, I'm going to look at the poverty targets that the international development community has accepted and ask what they imply for resources for the rural poor and resources for agriculture.

First, then, the paradox. Agriculture is where most of the poor work; the rural sector is where they live. Agricultural and rural development, we know, can effectively cut poverty. We say our target is to halve the number of people with less than a dollar a day to live on, between 1990 and 2015. And yet aid to agriculture has collapsed.

Aid to agriculture and rural development in the late 1970s accounted for more than a third of total aid. In the late 1980s, that figure dropped to about 24 percent. Now, it's nudging 10 percent. In real terms, the value of aid to agriculture and rural development is well under half of what it was in the late 1980s. And it has not been replaced by extra domestic agricultural and rural investment in developing countries. In many of them, investment in agricultural research is falling. In most of them, total investment in rural roads and rural education is under serious threat.

Many developing countries have prepared poverty reduction strategy papers, as part of the process following the 1996 Social Summit agreement at the UN to halve world poverty in this period (Organisation for Economic Co-operation and Development [OECD] donors have agreed to subordinate aid to this goal). Yet these strategy papers make little or no mention of agriculture and rural development, even though recent work by the World Bank shows that returns to agricultural *projects* are not worse than those to other projects. And, at IFPRI, Alston, Pardey, and others have shown that returns to agricultural *research* have not fallen in the 1980s and 1990s from their very high levels in the 1970s. Nor is there falling rural need relative to urban. Rural people still have much lower rates of literacy, poorer health, and higher poverty incidence than urban people, and the gaps are not declining.

Agriculture is where most of the poor work; the rural sector is where they live.

Is the problem that the poor are moving into cities, that they're not in agriculture and not in the rural sector anymore? We heard a very interesting discussion of urbanization from John Bongaarts, who confirmed that today about 70 percent of the world's dollar-poor—those with less than a dollar a day to live on—live in rural areas. Martin Ravallion's projection is that, even in the year 2035, half of the world's poor will be rural.

What about agriculture? In 2000, more than half of the total workforce in Sub-Saharan Africa and Asia still mainly depended on agriculture. At

least 60 percent of poor people in those areas did so. Sub-Saharan Africa and Asia between them contain 93 percent of the world's dollar-poor. For mass poverty to fall, extra workplaces, and extra chances to earn income from employment, have to go to those people. They have to get these resources if poverty is going to be attacked where it actually occurs.

Almost all successful large-scale progress against mass poverty started with more productive, small-farm, employment-creating activity, especially in food production.

Furthermore, extra workplaces are much costlier in the urban sector as a whole than they are in the rural sector and in agriculture—costly in terms of investment, infrastructure, and congestion. So affordable extra workplaces tend to be rural. Apart from that, urban poverty strategies are still based largely on better shelter, water, and sanitation. These are very important. But they do not provide the sustainable livelihoods and incomes that rural poverty strategies do. Rural poverty strategies tend to be more production-oriented—for example, the Green Revolution, microfinance, and rural public works.

Agriculture is not the only income source for rural people. The rural nonfarm sector is increasingly important for the rural poor. But the rural nonfarm sector tends to prosper only when agricultural customers demand extra resources from it, and particularly when smallholders and farm laborers get richer and use their extra income to buy local nonfarm products. So it is quite incorrect to say, "Don't worry about agriculture because the nonfarm sector is what it's all about." To get the transition to the nonfarm sector moving, it's usually necessary to get agriculture moving first.

From that we come to the historical lesson. Almost all successful large-scale progress against mass poverty started with more productive, small-farm, employment-creating activity, especially in food production. Why especially in food production? Because people who earn less than a dollar a day in purchasing power typically spend about 70 percent of their income on food and half of their income on food staples. And most of that is produced locally or nearby. So making those supplies reliable and keeping their prices from going up, or even getting them to go down—provided that nonlabor unit costs in farming are going down considerably faster—is crucial to consumption for the poor, just as employment is crucial to income for the poor.

However, later on, there is a transition—what you might call a poverty reduction transition—that comes from cash crops, rural nonfarm activity, and small towns. And the great successes of maintained poverty reduction in that transition, such as township and village enterprises in China, are almost always based on previous agricultural success. Demand for the products of these enterprises is created by small farmers and farm laborers; supply is often due to the savers and the entrepreneurs in smallholder agriculture, who then move into local, small-scale nonfarm sectors and carry poverty reduction forward.

To meet this changing demand, the poor have to be readily mobile and responsive, especially if they are to prosper during globalization. And that brings us to an extremely important resource both for adoption of new techniques for farm poverty reduction and for the poverty reduction transition: education. East Asia's great success in reducing farm poverty and then in moving successfully to the rural nonfarm sector has much to do with the fact that rural people, including rural women, were substantially educated early on in the process. Yet in both

South Asia and Sub-Saharan Africa, the rural sector, and particularly rural women, lag far behind the rest of the economy. These gaps are not shrinking. In many villages in Madhya Pradesh in India, for example, you will rarely come across a literate adult woman. That makes it much harder to get farm technology moving, or to manage the transition to nonfarm activities, especially if men leave the land.

The poverty reduction transition out of agriculture is well advanced in Southeast Asia, eastern and southern China, and parts of South Asia and Latin America. But in Sub-Saharan Africa, in inland—especially northern and western—China, in the "poverty square" of eastern and central India, the poor are still very largely rural agriculturalists and agricultural laborers. An interesting result that Peter Hazell from IFPRI and his colleagues have found is that the returns to scarce resources, in terms of both extra output and poverty reduction, are often highest in the so-called backward areas. That has been the case in both India and China, not in all backward areas, but in some. So a shift of new resources that raise demand for labor—resources for irrigation, rural roads, farm research—to some disadvantaged areas is efficient for growth and helpful to the poor, who now mostly live in these areas, so they can earn their way out of poverty.

Unfortunately, that is not what we're doing. Neither the international community through aid, nor the developing countries themselves—with a few exceptions—are steering resources to the rural and agricultural sectors to an extent commensurate with their role in poverty reduction.

Coming to the second issue, what then is the role of the state in getting resources to the rural poor to combat their poverty? In the past, political-economy forces have led many developing societies to extract resources from the rural poor, harming both equity and efficiency. It has been wrongly inferred that the main need for rural poverty reduction is to shrink developing states. This over-reaction is being corrected to some extent, but often people still say, "Yes, rural poverty needs to be attacked, and mainly through agricultural development—but leave it to the private sector."

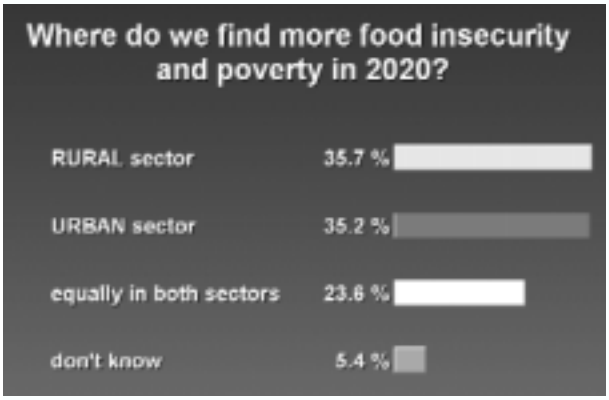
But the state reflects the society in which it is placed. Urban bias is not a feature of the states, but of societies and nations. Particularly in open and democratic societies, states can be held to account and made to adopt a positive role in rural poverty reduction, providing both true public goods (such as research into open-pollinated maize populations) and merit goods (such as education). Thus the state can provide the essentials of early farm growth and route it to the poor. The private sector can produce things like agricultural research, some forms of irrigation, microfinance, health care, and education, but it will seldom provide them on a large scale for people earning a dollar a day or less in dispersed rural areas. If the very poor are to have a chance to become efficient rural producers, some form of state support—not necessarily state production—is required to allow infrastructural facilities (not merely classic public goods) to be tailored to the needs of these poor and to reach them.

Further, the state has a role in changing incentives, taxes, laws, or consensus to favor land distribution. Land is an essential resource for many rural people if they are to escape poverty. The distribution of land in eastern and southern Africa and in Latin America and the Caribbean is so unequal that land reform, land redistribution, is almost inevitable if there is to be a major reduction in poverty. Only states can make land redistribution happen, and it can be done in a consensual way, without disrupting and destroying the agriculture it is supposed to save.

A demographic window of opportunity exists, during which appropriate rurally oriented state action has a unique chance to slash rural and hence national poverty. We heard from Professor Bongaarts about the demographic transition in age structures that is causing aging

We still need yield-enhancing technical progress.

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

populations in Europe and in Japan. That same demographic transition in many countries of the developing world, including most of South Asia and Sub-Saharan Africa, is dramatically raising the ratio of
people aged 15–59 (the prime workforce with the resource of labor capacity) to children.

In the 30 years from 1995 to 2025, the ratio of this "prime" workforce to others (aged 60 or more, or under 14)—mainly dependents—will double in Kenya, Bangladesh, and many other countries. That change is already beginning to enable families to support their fewer children through better education and better food. In East Asia's demographic transition, a similarly rising workforce/dependent ratio added about 1.7 per cent to GDP and substantially cut poverty every year from 1965 through 1990. But in Africa and much of South Asia the gains for rural people from an apparently similar transition are still small and slow. This can improve dramatically, but only if two things happen. Both need state action.

First, the state needs to spread the motives and incentives for fertility decline to lagging rural areas and to the poor. Everywhere the poor and the rural sector lag behind the rich and the urban sector in fertility decline because they lag behind in female education and in the health measures that reduce child mortality. Only the state, by appropriate action, can get these things right.

Second, the state has to intervene to raise rural employment prospects. That can only be accomplished if two underlying issues are addressed: the water squeeze and the sharp slowdown in the rate of improvement of crop yields.

Water starvation is already damaging agriculture in much of the semiarid world. Even with a rather conservative projection, the rise in temperature due to modest global warming between now and 2025 will raise the rate of evapotranspiration and therefore make water both scarcer and less reliable in some of these areas. The World Water Commission rightly emphasizes the need for proper, market-based water pricing, and this is an essential part of the solution, but only part. Water redistribution toward the poor, water-yielding asset redistribution toward the poor, and water quality improvements are essential. Above all, the poor need new basic science—not just better applied technologies—for water control and water management.

We've had a Green Revolution, but the last Blue Revolution was more than 2,000 years ago, when the people of China, Mesopotamia, and Sri Lanka learned to control both gravity flow systems and groundwater systems. Since then we've seen brilliant tinkering at the edges of engineering. But we've seen nowhere near the basic water science that is needed to meet the intense water squeeze coming in the next 15 to 20 years—a squeeze that is especially damaging and threatening to the rural poor in the semiarid world.

Apart from water technology and "water reform," the sharp fall in yield growth in the main food staples in the developing world—from 3 percent yearly in the 1970s to barely 1 percent now—and hence in employment growth, is unlikely to be reversed without remedying the global misdirection of biotechnology research. Such research should be shifted away from the marginal problems of the rich and toward the food needs of small farmers and workers. Moreover, without gene transfer from other sources, we are unlikely to see rapid gains in the yields or even the robustness of crops such as millet, sorghum, and some tubers, already adapted to the fragile conditions of semiarid or upland areas.

States need to take the lead in turning around,

and reviving, the water and seed aspects of science-based agricultural development. The Green Revolution showed that the gains from public-sector research can be steered to poorer farmers and farm workers (and small farms are, in general, no more environmentally depleting than big capital-intensive farms). But most biotechnology researchers, and some of the knowledge, are locked in private firms. Furthermore, a new scale and type of water research is required. The issues facing public and private sectors are not the same as those of getting Green Revolution research moving and working to reduce poverty.

We still need yield-enhancing technical progress. It's hard to see that happening without, first of all, better water control. In Sub-Saharan Africa less than 3 percent of the land is irrigated cropland. In Asia that figure is more than 35 percent. Sub-Saharan Africa must have much more water control, and not just micro-irrigation and onfarm, farmer-controlled systems, desirable though they are. Substantial large-scale water control is needed. To advocate this may not be "hydraulically correct," but without large-scale control of water supply in Africa, and without substantial genetic modification of crops such as millet and sorghum, which are currently adapted to survive at very low yields in poor conditions, Africa will not meet its poverty or food-security targets.

For those of you who want to see what Green Revolutions can do for semiarid areas with the help of biotechnology, I recommend the 2001 annual report of the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), on control of downy mildew and on *striga* (witchweed) as it affects sorghum. These are among the many possibilities that biotechnology opens to us, but they will not happen in the present context in which private companies control the agenda of biotechnology. These companies are quite properly working for profit to satisfy the needs of wealthier people in rich countries.

We can expect the large companies to donate 5 percent of their work for public relations reasons and to do it brilliantly in ways that help solve the problem of world poverty. But if we want not 5 percent of their work but 20 percent of their work to be directed to those ends, then rich countries' taxpayers must pay for it, whether driven by ethics or by self-preservation and fear.

Let me pass now briefly to some other challenges in the area of productive resources for the poor. In a number of areas, the experience of IFAD, as described in its *Rural Poverty Report*, shows that we are learning the institutional lessons. In microfinance, forest management, and water users groups, great improvement has been made in the participation of the poor in the management of the resources that affect their destiny and, therefore, in the efficiency with which those resources are used. Participation isn't necessarily equitable, but it is efficient.

However, just as we're learning this lesson about institutional efficiency, the hardware—the technology that productively employs the poor and cheapens their food, and the transfer of land and other assets to the poor—is failing us. Land reform has practically stopped, except in a small number of ex-communist countries. The growth of yields, due particularly to technical progress in water control, has slowed down. Irrigation investment in South and East Asia, in particular, has slowed down considerably. Something needs to be done to provide the hardware if the software is going to help deliver food security to the poor.

Let me come finally and briefly to the question of targets. It can be done: dollar-a-day poverty can be halved over the period 1990 to 2015. If we achieve—between now and 2015—the rates of poverty reduction India and China achieved between 1975 and 1990, then we shall meet the target. But so far we're not doing well. If each major region does no better after 2000 than in the 1990s, we are on track to underfulfil the target by a full 60 percent. We know what to do to revive technical progress in basic staples food production so that the poor have the employment and the access to food that they need. We know that they need land reform, water reform, and new technologies for

crop production and water management and
control. But both development and aid policies must be transformed to meet that target.

Discussion

Owing to time constraints, the discussion was limited to two comments from the audience. As in the first discussion session, the poorest of the poor emerged as a concern. A participant stated that people always talk about reducing the number of dollar-poor, who are definitely not the destitute. It may be relatively easy to get the people who are just under the one-dollar threshold over it, but what about those who are far below that threshold? Should we not also be setting targets for and monitoring the very poor? Michael Lipton responded that there is often a temptation, in trying to reach the poverty reduction target, to tackle the least difficult cases nearest the poverty line. In retrospect, the poverty reduction target should have been set in terms of an indicator for severity, which would give more weight to reducing the poverty of the poorest of the poor. He added that it would be more beneficial to focus on food poverty—how much food does a person or household need in order to have enough to eat—instead of the purchasing power parity dollar. According to Lipton, although it is important to concentrate on the poorest of the poor and shift incentives accordingly, a shift in targets and a change in definitions should not be made midstream. The donor community, governments, and civil societies should be encouraged to meet the targets that have already been developed.

The second comment noted that development interventions often seek to enhance agricultural production. In addition to supporting the supply side of the food chain, should we also support the demand side? Lipton replied that for the poorest of the poor, who have a food deficit, the demand side is taken care of by making it possible for them to supply more food either on their own plots or on land that they acquire. Increased agricultural production is most important not for the large farms, which are already producing surpluses, but for the small and deficit farms so that people can acquire more food to meet their own demand and cure their own undernutrition. At a later stage of development, problems on the demand side do arise. Small farmers in Latin America and much of East Asia find it difficult to enter the marketed surplus food chain. In marketing export crops, small farmers have disadvantages in areas such as quality control and pesticide standards. The case of peasant marketing cooperatives in Guatemala working closely with a group of multinationals is an example of how to overcome these problems.

Chapter 10

Making Globalization Work for Developing Countries: The Role of the World Trade Organization

Chair: Mahmud Duwayri

Minister of Agriculture, The Hashemite Kingdom of Jordan

This session, on globalization and the World Trade Organization, is not an easy topic. Both globalization and the WTO have sparked uneasiness and many demonstrations. Our discussion today addresses food security. Does globalization work to improve the situation for food security? Does the WTO help us increase food security, reduce hunger, and alleviate poverty?

As Minister of Agriculture in my small country, I believe and I have assured our farmers that Jordan has been blessed by becoming a member of the WTO and our farmers should benefit from that membership. On behalf of the many farmers in the world, we need to work together to see that the WTO works to secure food for farmers in order to help our countries—especially the developing countries—achieve harmony and have a food-secure population.

Keynote: Supachai Panitchpakdi

Designate Director General of the World Trade Organization and former Deputy Prime Minister and Minister of Commerce of Thailand

As you all know, the final verdict is still out on globalization. Globalization is everything to everyone. Interpretations of globalization have already been mentioned in hundreds of books, so I will not take up the challenge to discuss what globalization is.

But once in my lifetime I experienced globalization firsthand. It was last year when I was chairman of the United Nations Conference on Trade and Development (UNCTAD) 10 meeting in Bangkok. As chairman, I had to come out and welcome Mr. Camdessus. As you know, Mr. Camdessus is a Frenchman, who used to be the managing director of the IMF. The IMF, along with the WTO, does not always have the favor of civil society, so we gave special protection to Mr. Camdessus when he came to Bangkok. Also, Thailand was the first Asian receiver of the IMF's generosity in terms of financial assistance, sometimes to the liking of the public, and sometimes not to its liking. So we gave Mr. Camdessus special protection.

I told Mr. Camdessus, "Please walk with me behind the stage. Don't come out in the front part of the hall, because a lot of people would like to greet you with things you would not like to be greeted with."

He said, "No, no, Supachai. I'm your friend. Here are all my friends here. I walk with you into the room."

So we walked into the room, and a man, fortunately not a Thai—we learned later on he was an American—came up with a big piece of cake, and in front of me, he put the cake into the face of Mr. Camdessus. I was standing behind him.

That was globalization in action: a cake thrown by an American, the cake was Thai, and the face was the French face of the managing director of the IMF. With that one action, everyone in the meeting realized that we needed to be together in the solution to globalization, just not in this kind of action. We need to be together in trying to harness whatever globaliza-

tion might provide for us in terms of opportunities.

A couple of weeks ago I was at Yale University in New Haven, and the students were protesting against me, against the WTO. The police actually cordoned off the whole meeting hall and asked me whether they should allow students to come in. I said, "By all means. I came here to lecture to the students. Let them come in." The policeman said, "What should we be searching for, arms?" I think I said, "You search for only one thing. If they don't have cakes, let them come in, because the only thing I fear is the cake."

I say all this by way of introducing my topic. I want to be frank with you: I demand three things in all these discussions. First, we must analyze the situation. We cannot just recant the old ideology, that free trade is good for everyone. We have to use analysis to prove that trade is good and to understand what it is good for.

Second, when we have the analysis, we need frank assessment. When something has gone wrong, we need to assess why it has gone wrong. Why was Seattle a debacle? Seattle was a debacle not mainly because of the people outside of the meeting hall, but because there was too much politics involved, too little preparation, and the majority of countries were miles apart. So we have to analyze and learn.

Last, we need to take action. All together we can help put words into action. IFPRI has been doing all these things: analyzing the world food situation, trying to make frank assessments, and trying to put the results into action and recommend that governments and international organizations put the results into action.

Now I want to discuss the environment surrounding the process of globalization. We need to see whether globalization can benefit the poorer countries. And we need to consider, in particular, the role of the WTO.

I have been experiencing three things around the world that we need to address. The first is a lack of real understanding of what globalization is all about. We tend to take for granted that, for example, when telecommunication costs become cheaper, everything will be linked. Information will cross borders quickly. People will learn about things in real time. Whatever happens in one place will bring a response in the next; for example, if the Federal Reserve reduces interest rates today, the stock prices in Asia will go up tomorrow.

Globalization gains can be wiped out in no time at all if we're not well prepared.

Conference Opinion Poll*

**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

So we need to understand what globalization is all about. Otherwise, globalization gets not a bad name, but a worse name—even worse than before. Asia used to be the vestige of the globalization process in action. Asian countries used to be open. And though they still are open, they are not enjoying the openness of their own economies much these days. Having been open for a few decades, having reaped the benefits of being open, they saw the value of their assets—so carefully built up in decades—wiped out in two years' time, in 1997 and 1998. So globalization can bring many benefits to countries, but globalization can also bring about destruction; and destruction can be swift and highly detrimental for years to come.

In two years' time, the value of Asian currencies dropped 50, 60, 70 percent; asset prices dropped 80 percent. We held a fire sale of all the assets that we seized from the banks. Throughout Asia, the average price of the assets we sold was 20 percent of the asset value. These assets are buildings, land, power plants, and hospitals. They are real assets, but the value has been reduced dramatically.

To reiterate, we need a better understanding of globalization and what can be gained from it. But we must also be on our toes all the time. Globalization gains can be wiped out in no time at all if we're not well prepared.

Second, we need to remind each other that the Asia crisis has spread throughout the world. It has affected countries in South America such as Brazil and Chile. It has affected Russia and Europe. It has affected parts of the United States, particularly the western part that had a lot of trade with Asia. It has affected the IMF and has actually induced it to look into opportunities to restructure and reform itself, as we in Asia have to reform ourselves.

The WTO should be strengthened such that it can provide more assistance to and garner the participation of the poorer countries.

I want to emphasize that we must not be misled into thinking that this crisis is unique, that it happened because there is so much corruption in Asia or because this is crony capitalism. Capitalism is "crony" everywhere—although in business schools they call it networking. There is no difference between cronies and networking.

The crisis in Asia is still with us. And it is not a one-time affair or unique to Asia. It could easily take place in northern Europe, as was evident in the early 1990s when various Scandinavian countries devalued their currencies. It can take hold in any part of the world because it is a systemic part of the capitalist market society.

In the past we learned of long economic cycles. The cycles have become shorter and shorter, and more and more cycles are coming up every day. Shorter and more frequent cycles occur because of the short lives of inventions and applications of new products, because of interest rates moving up and down, and because of floating currencies. And the effects of all these cycles have been magnified. In the past, countries that made one small mistake might suffer only a minor adjustment. Now the adjustment is huge. If the Asia crisis had happened 10 years ago, in the early 1990s, the countries might have gone through, say, a 10 percent or 15 percent devaluation, and the situation would have been manageable. Now, after a 50 percent devaluation, they are not out of the woods yet.

So crises will be stronger and stronger, and they will recur. I believe we are approaching the second crisis—probably not in Asia but in the United States and Europe because of the slump in the new economy, the so-called high-tech industries, and in the telecommunications industries. This slump has spread into Asia. All the growth rates in Asia have been revised downward into negative territory, even for countries like Korea, Taiwan, Malaysia, and Thailand. They were doing well last year, but this year, because of the crisis coming from elsewhere, they are being hit again. Unless the whole world gets its act together, we will have a second crisis on our hands.

The third aspect of globalization to consider at the moment is the trade rounds. The trade rounds are supposed to benefit the whole world by enhancing competitiveness, expanding the marketplace to increase trade volume, enhancing the value of the goods we trade, and improving the welfare of consumers. Thus consumers should be able to choose among goods that will become less and less expensive as a result of the competitive positions of the people involved in international trade.

You have heard a lot of comments on and criticism of trade in the past. Developing countries complain of the lack of balance, in that sometimes they have to exchange things that are not really equal, that sometimes they have to negotiate on terms that are not even equal. The developing countries started off in the last round, the Uruguay Round, with a promise of full liberalization in

agriculture. We ended up with one-third and perhaps should be pleased to have actually gained one-third. It was a good beginning. That is why we have the so-called building agenda—we will continue negotiations on agriculture.

Consider what actually happened in the last round. The two things that developing countries got from the Uruguay Round were market access for agriculture and the phaseout of the multifiber agreement, the so-called quota for textiles. Textiles are probably the only commodity in the world with an exemption from the WTO. The multifiber agreement has allowed more advanced countries to set quotas so they will not be flooded with textile products from the developing countries.

Therefore, the two things developing countries gained in the Uruguay Round relate to agriculture and textiles. With textiles, they got a 10-year phaseout program. In the first five to eight years nothing happened. Only in the last two years have advanced countries begun the real elimination of quotas for the products coming from the poorest countries. In agriculture, gains have been made in terms of market access but not in terms of eliminating subsidies—subsidies actually have mounted. Going into the next round, agriculture will still be a hot topic.

Developing countries also have some complaints about the TRIPS agreement. They are being asked to increase their effort and pay the cost of setting up the TRIPS regime by, for example, creating the legal framework for the TRIPS courts. Developing countries also have to seek access to drugs because the rights of the inventors of the essential drugs are protected. They have to pay this price but in exchange for something that they are not really gaining.

Let me suggest two things that the WTO can do. The WTO, of course, is a member-driven organization, so it's not for Mike Moore or for me to say you should be doing this or that. We can help the process, give advice, but we cannot decide on behalf of the members. The members themselves will have to decide what to do.

...in the new round of negotiations, we need to include as much of a development-related agenda as possible.

But I have in mind two recommendations that would help the WTO facilitate the process of making globalization useful for the poorer countries. The first could be called structural changes. The structural changes needed at the WTO mainly cover the participation of the poorer countries in the process in Geneva. People have complained that sometimes they are left out. They are not really left out. They just need to know how to participate actively. This we have to remedy.

The organization should be restructured in a way that it can provide more technical assistance. The WTO cannot be turned into a development organization like the World Bank. But it needs to have more coordination, more coherence, with other international organizations like the World Bank, IMF, UNCTAD, the International Labour Organization (ILO), United Nations Industrial Development Organization (UNIDO), and UNDP so that trade can be included in all their programs. Trade can help solve a lot of issues if it is well coordinated. If people are taught to produce something that cannot be sold, then they are wasting their time. People need to be taught to build something and be efficient in production, but they also need to be taught how to distribute their goods and to distribute them in a way that avoids losing all economic gain to the middle man.

The WTO should be strengthened such that it can provide more assistance to and garner the participation of the poorer countries. The WTO also needs more members. Thirty acceding countries are waiting in the wings to join. We have 142. We should have 170 quite soon. But we need to facilitate the process of gaining accession to the WTO.

There are also technical issues to consider. Technical issues will be included in the new round of trade negotiations, so developing countries will need help preparing concrete proposals to present to a new round. For example, we need to come to grips with antidumping procedures. Developing countries are being investigated for antidumping.

This has become another means of protection, and it has to be eliminated. Antidumping will have to be discussed.

Agriculture will also have to be discussed—specifically, six points: (1) tariff reductions and market access; (2) the substantial reduction of domestic and export subsidies by major developed countries; (3) a cap or reduction in production-related support measures; (4) special and differential treatment for developing countries (the principle is there but needs to be put into operation); (5) total elimination of export subsidies and any subsidization as part of export credit; and (6) development of transparent disciplines for export credits.

I would like to end by saying that in the new round of negotiations, we need to include as much of a development-related agenda as possible. That means agriculture will have to be in the round, as will antidumping and textiles. Textiles should be dealt with in such a way that advanced countries can offer some concessions, knowing that textiles will be a sunset industry in those countries anyway. Textiles should be transferred as smoothly as possible into the poorer countries. Textiles and agriculture together amount to more than 50 percent of the total exports of some countries.

In the new round we need to put into practice the special and differential treatment approved in past rounds. Countries with single-export communities, small countries, and countries with nothing to trade must become part of the trade round and look forward to making use of it. We need as much coordination and coherence as possible. For example, when we finish a new round of negotiation on agriculture, we should include in the protocol the need to provide assistance to food-deficit countries. That was done at the Marrakesh Agreement for the Uruguay Round, but nothing happened. There is a link between trade and finance. There needs to be a fund to finance the inventory build-up in food-deficit countries.

We need to succeed in our negotiations, but we also need to take care that the rise in food prices will not hurt those countries that do not have adequate supplies of food commodities. When we eliminate impediments to market access in terms of tariff barriers, a host of nontariff barriers arise. That outcome is sometimes called the multifunctionality of the agriculture sector. Sometimes it is attributed to cultural reasons, sometimes to sanitary and phytosanitary standards (SPS). All kinds of new impediments to market access are being put up.

The European countries will have to actively participate in the new round and try to put up the agenda, particularly on agriculture. The international institutions, the WTO and the rest, will have to create programs that will support countries that participate in the new round, but which may end up net losers. Those countries need to survive and will need an adequate supply of food to do so.

Discussion

Although time for discussion was limited during this keynote presentation, three comments from the audience allowed Supachai Panitchpakdi to further highlight the role of the WTO. Asked for his views on food security, Supachai responded that first, there must be a system to finance an inventory of food, and second, as mentioned in the idea of a food security box, support programs are needed. In the past, categories such as the green box or the blue box have allowed countries to give so-called nonactionable subsidies to

research, transportation, environment, or regional development. The so-called development box is now on the agenda of the developing countries and is being discussed. Under this proposal, small countries and small farmers would get some time to come into compliance with trade rules and some nonactionable support.

In follow-up, another participant suggested that perhaps the development box concept could be extended to countries of the former Soviet Union, which will be seeking entrance into the WTO, as it is not always clear whether they are categorized as developing countries or not. Agriculture is vital for the rural population of these countries, and they have strong potential for production. Because the WTO is member-driven, the big member countries and big agricultural exporters of the WTO might try to impose conditions on the accession of these countries that could make it difficult for them to develop their agricultural sectors. What steps can help these countries successfully enter into the WTO? In response, Supachai said that although the development box would not be useful in this case, the coming round of talks would include discussion of accession procedures and explore the possibility of rationalizing and simplifying these procedures. Globalization should be discussed with the participation of global society, so it is important to have as many members join the WTO as possible. For the poorer countries that do not have much to offer, Supachai wondered whether special and differential treatment should be given to them. Regarding the countries in transition, he observed that they actually need to make two transitions: one from a socialist to a market economy and another from a market economy to a rule-based system. These two-transition countries are having difficulties accomplishing these changes. The process for China was exceptional because that country was resuming an old seat; it was not altogether a case of accession. Supachai suggested a special allowance could be made, permitting countries to become "associate members," which would qualify them to participate in the process of the WTO but allow more time to make legal reforms.

When a participant raised the issue of property rights and giving access to seeds and agricultural technology to the poor, Supachai replied that the WTO cannot play a large role in access to technology, but use can be made of the UN-sponsored integrated framework. The integrated framework can be improved so the least-developed countries have greater ownership of the program. Trade is not enough, especially for small-scale farmers, but because aid has been so reduced, it is important to make trade useful for all concerned. Developing countries must have greater participation at the negotiating table and must have their own explicit agenda. Still, developing countries cannot expect the WTO to solve all of their problems. Improvements must start at home. Domestic policies must be trade friendly; countries must pursue market reform and avoid policies of government intervention.

In closing, the Chair, Honorable Minister Mahmud Duwayri, recommended that the WTO work with FAO on food security and to speed up capacity-building so that developing countries can prepare to join the WTO. Globalization and membership in the

WTO are essential for achieving food security. He continued that other stakeholders—the donor community, international research centers, and NGOs—all need to work together to achieve food security, particularly in the developing countries. Developed countries should be major players in this effort. Policymakers in developing countries need to become aware of the importance of national and international issues of food security, and international organizations like FAO and the international research centers should play a fundamental role in this awareness-raising process.

Chapter 11

Putting Globalization to Work for the Poor

Chair: Isher Judge Ahluwalia

Director and Chief Executive, Indian Council for Research on International and Economic Relations

The subject of this panel is putting globalization to work for the poor. We will be discussing this in the context of food security. It is important to recognize that food security for the poor of any country depends principally on the economic conditions, government policies, institutional structures, and state of governance in that country. Globalization influences not only the external economic environment but sometimes also the internal economic environment in the country in a major way. And it is the country's engagement with this environment that affects the conditions for income generation. While income generation and growth are both necessary and important, they create food security when joined with policies facilitating access to food by the poor.

Globalization can play an important role as a facilitator. How do we ensure that this happens? Globalization is supposed to offer tremendous opportunities for trade, investment, and the transfer of technology. But can we say that developing countries have access to the agricultural markets of industrialized countries today? Increased trade brings with it increased vulnerabilities. How do we raise the capacity of developing countries to absorb these shocks? How do we encourage the transfer of technology to developing countries to help improve yields when the TRIPS agreement is the order of the day? Do we end publicly funded research and development for global public goods?

Finally, as we add more and more dimensions to the agenda of development, be it environmental concerns or better work conditions, or a greater role for women, we also see industrialized countries place nontariff barriers on exports from developing countries. If trade and not aid is the name of the game, is there room for nontariff barriers to trade?

Eugenio Díaz-Bonilla

Senior Research Fellow, International Food Policy Research Institute*

My presentation today on globalization, poverty, and food security draws on work that we are conducting at IFPRI, as well as other sources. A more detailed discussion of this topic appears in the set of IFPRI 2020 Focus briefs, entitled *Shaping Globalization for Poverty Alleviation and Food Security,* that Sherman Robinson and I edited.

The starting point is to recognize that there are sharply divided views on globalization. The following quotations are among the many that can be extracted from current writings:

"Instead of reducing inequalities, globalization… exacerbates them… The poorest countries are getting poorer, both in relative and absolute terms… In the final analysis it is democracy itself which is the prime victim of …globalization." (Article in *Le Monde Diplomatique,* May 1997)

"Globalization …marks the successful worldwide spread of the economic liberalization that began nearly 50 years ago… It is now bringing unprecedented opportunities to billions of people throughout the world. Inevitably those who fear

* Summary note included in Appendix 3.

markets and foreigners clamor against it. Their voices must be ignored." (Article in the *Financial Times,* May 1997)

Such disagreements have emerged in more painful and tragic ways from Seattle to Genoa.

Why do we have these disagreements? The answers have to do with methodological issues, the time period analyzed, and the regional focus. So, even if we agree about what's going on, the question is what does globalization have to do with it. These are the two questions—What is globalization, and what are the main drivers? And, even if we agree on them, what are the links between globalization, so defined, and the outcomes attributed to it?

In considering the nature of globalization, we need to look at more than just trade liberalization and economic aspects, although they are very important. We should also examine increased noneconomic linkages—political, social, and cultural—that create new alliances. And we have international legal and regulatory frameworks, including not only trade agreements and environmental agreements, but also things like accounting procedures and banking supervision procedures.

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One important thing that seems to be related to globalization is the spread of democracy in the 1990s. For the first time, democratic countries outnumbered nondemocratic countries. Other global effects stem from the behavior of individuals and societies, such as climate change, global warming, the spread of HIV/AIDS, and financial crises.

Even if we agree on what globalization is, there may still be disagreements regarding what's driving it. Is globalization occurring because governments are "doing" something or because something else is "happening"? The answer depends on your view of the drivers of globalization. Some people may focus on a particular driver—market-oriented policies, technological change, the end of the Cold War and reduction of conflicts, or even population growth, considering that the doubling of the population has created more linkages across the world.

Emphasizing different drivers will also lead to different policy implications.

So far, I have mentioned discrepant interpretations of data and outcomes, on the one hand, and the nature and drivers of globalization, on the other. Let us assume that we agree on all those issues. There may still be disagreements regarding the links between globalization and outcomes (for instance, poverty or hunger). Here we need to look at three separate issues. First, we must consider the relationship between a country and the world. How integrated is a country with the world system? But to understand the relationship between globalization and outcomes, we need to look at a second issue: What are the internal conditions, institutions, and policies in developing countries? For two countries with the same level of integration, the outcome may well depend on domestic factors and policies, such as land tenure, presence of democracy, the status of women, the adequacy of macroeconomic policies, the natural endowments of the country, the extent of the communications, and so on. Much of the policy advice that developing countries receive focuses on what domestic policies complement globalization, particularly those that are pro-poor.

Third, we must consider the global conditions, which are mostly determined by industrialized countries. Sixty percent of global GDP comes from the developed countries.

I want to use the rest of my time to briefly discuss this third aspect, a crucial one for determining the possible links between globalization and outcomes, and therefore of prime importance in creating a pro-poor global economy. I'd like to look at six areas that greatly influence the state of the global economy and society. These areas are largely the responsibility of the industrialized world.

The first area comprises peace, democracy, and good governance. The developed countries, the rich countries, should maintain diplomatic and political engagement and provide financial support to help with peace and reconciliation and the transition to democracy. That involves issues such as the controlling of trade in products that finance war, for example, diamonds and drugs. As Marc Cohen shows in one of the 2020 Focus briefs on globalization, the industrialized countries remain traders of arms to developing countries. Moving from peace to corruption, codes of conduct come into play. We need to ensure that firms in industrialized countries abide by anti-bribery codes and that there are no safe havens for money laundering. It is asymmetric to criticize corruption in developing countries and not acknowledge the bribes paid by firms from industrialized countries. Thus the policies of industrialized countries should help and not undermine anticorruption efforts in developing countries.

A second area is international trade. Because that topic has been covered already, I'm going to move to the third one, international finance. Many crises over the last 30 years occurred because of changes in macroeconomic policies in developed countries. So the first issue is how to achieve macroeconomic stability at the world level. Of course, developing countries need a stronger macroeconomic and financial framework, but a lot of the shocks have come from changes in the industrialized countries. So we need better macroeconomic coordination between developed and developing countries. Within that more stable framework, poor countries need additional capital, additional finances, including the Heavily Indebted Poor Country Initiative; and a substantial increase in funding for investment in rural development, poverty alleviation, and health and nutrition, particularly from the World Bank, regional banks, and other donors.

The fourth area is technology. The industrialized countries can provide scientific and financial support and help create public-private partnerships for research in areas such as biotechnology. The same types of support should also apply for health issues. And the fact that we are still discussing intellectual property rights means that public and private concerns do not seem to be well balanced. So we need to keep on analyzing that issue.

In terms of the environment (the fifth area), the responsibilities of industrialized countries in shaping environmental conditions must be recognized. In the industrialized world, complaints are often heard about developing countries enjoying unfair advantages because of a presumed lack of environmental regulations (these allegations, if true, could only have local effects). Such complaints are inconsequential when compared to the larger responsibilities of the developed countries in shaping global environmental conditions that may adversely affect the poorest of the planet.

Finally, in the international context, we need to improve and strengthen institutions and ensure the participation of developing countries in those institutions. Global problems require global approaches. It is my view that protectionism, isolationism, and unilateralism will not solve the world's problems.

In conclusion, it is true that adequate complementary domestic policies in developing countries are very important if globalization is to benefit the poor. But what seems even more fundamental is that we have diplomatic, military, trade, financial, technological, and environmental policies in the industrialized countries, along with international institutions, that really contribute to a pro-poor global world system.

Robbin Johnson
Senior Vice President, Cargill*

Putting globalization to work for the poor is a difficult and often emotional subject. I would like to break it down into two parts, the fundamental transformation that must occur within poor countries themselves, and then the effects that globalization can have on that transformation.

First, let's talk about the domestic transformation. Building sustainable food security is not a simple extension of what developing countries already are doing. Rather, it is a fundamental and far-reaching socioeconomic transformation that touches every aspect of life in emerging economies. It is a root and branches change. Moreover, 70 percent of the world's poor live in rural areas. We cannot end hunger without transforming the existence of those rural poor. That process begins by increasing the agricultural productivity of small farmers. Michael Lipton described many of the how-tos. I merely wish to reemphasize the magnitude of that change.

I also want to highlight another dimension of it. As agricultural productivity rises among small farmers, workers are freed up. Rural off-farm employment needs to be created for these surplus employees for two reasons: (1) to sustain the demand for the increased food production, and (2) to keep those people from migrating to already overcrowded urban centers. Rural economic diversification within national economies must grow if we are to reduce rural poverty and hunger rather than just ship it to large cities.

Important national policy components are needed to stimulate this transformation and to capture its benefits for the poor. Those components might be thought of in three layers. The first layer involves wringing out any policy bias against agriculture in rural areas—things like overstated exchange rates or import protection for domestic input industries. The second layer involves investing in the public goods needed by the poor: the physical infrastructure that can make rural areas attractive places to live and work in, and the social infrastructure that can equip rural dwellers to live better lives there. Finally, the third layer involves developing information systems, support institutions, and regulatory frameworks to promote competitive markets and equitable access to them.

Where these public policies and public goods are available, markets can work to enhance prospects for the poor in three ways. First, markets can replace dependency with income-producing jobs. Second, they can diversify the supply of goods and services available in the emerging rural economy. And third, they can attract capital and technology for expansion, innovation, and sustainable growth. This is not a simple extension of traditional ways. It is once again a fundamental transformation of rural lives and livelihoods, and it will be destabilizing regardless of what's going on in the outside world.

Now let's turn to the second part of my talk: globalization's effects on this transformation. Globalization brings both benefits and risks for the poor in emerging economies. Four benefits are worth noting here.

First, globalization can bring access to new markets. Agricultural and textile protection alone cut the poor off from an estimated $700 billion in potential markets. Industrial countries have been reluctant to grant this access in the past, but a new WTO round could change that. Second, globalization also can bring needed capital and marketing skills to expand local production and, perhaps more important, to install the quality systems needed to connect that local production with global demand. Third, it can bring new ideas and new technologies. There are issues of matching technology to local needs and anchoring technology development capabilities within the recipient countries. If done well, such efforts can add to the catalytic effects globalization can have in transforming these emerging economies. And fourth, globalization can bring trade-based food

...putting globalization to work for the poor is possible but by no means easy.

* Summary note included in Appendix 3.

security strategies that can supplement or supplant local food production or food aid in offsetting the inevitable swings in local crop production.

Several risks of globalization must be managed. While globalization can accelerate the economic development process, it also reduces local control over one's own economic destiny. When global markets sag, for example, local markets may not just slow down, they may plunge. Mr. Supachai graphically illustrated that for us this morning.

Also, globalization can bring with it new demands that can burden or slow a developing country's growth. No doubt higher labor standards and better environmental performance are good things to add to the development equation, but just when they become affordable or desirable is not self-evident.

In addition, globalization can impinge on a developing country's freedom to act. A good example is agricultural biotechnology, where poor people have often lacked adequate representation when the rules defining intellectual property rights or consumer choice are being written.

My own conclusion is that putting globalization to work for the poor is possible but by no means easy. It brings on the one hand a catalytic potential to accelerate and broaden the needed socioeconomic transformations of developing countries. But on the other hand it brings risks and a loss of local control—just as, incidentally, it does to many developed countries. The main point, perhaps, is that we are more likely to find a constructive balance if all of the parties that have a role in achieving sustainable food security can beat their confrontational swords into collaborative ploughshares.

Chee Yoke Ling

Legal Adviser, Third World Network

Ten years ago the seeds were planted for two eventually clashing paradigms about what we want for our world and what we want for our own societies at home.

We all remember Rio and the intense discussions and negotiations that led to the UN Conference on Environment and Development. This marked a significant shift in the development debate, not just in theoretical terms but in the analysis of real situations and the realization that business as usual was not going to be sustainable for the environment, for natural resources, and ultimately for the development of developing countries. Poverty was increasing. Net outflows from the South to the North were up to $500 billion a year as a result of the inequitable international economic system, including low commodity prices, unfair terms of trade, and the unresolved external debt issue. That was where we were 10 years ago.

So what was the resulting partnership for global cooperation about? It combined cooperation, collaboration, and the need for technologies that were environmentally sound and that also served economic and social needs. It meant assessing technology to make sure that it fit development needs in a sustainable way.

Financial assistance was also clearly recognized and needed, not just in aid terms (although that remained very much a commitment made 10 years ago at the Rio conference), but also in terms of structural changes to the international economic environment to redress the inequities of the system. Governments, international institutions, and civil society recognized the net outflows from the South to the North in terms of resource exploitation. As a result, there was a lot of euphoria and expectation, and all the UN conferences that followed Rio—on social development, on population, on women's rights, the whole gamut of the UN compacts—really were about cooperation. In the middle of all that, agriculture—sustainable agriculture and rural development—remained one of the most important issues involving public research, sound technologies, participation of small farmers, and support for enabling domestic and international policies.

However, other seeds were planted at the same time that received far less public attention. Those

seeds became the Uruguay Round of agreements, and today, almost 10 years later, we have a clash of the two paradigms. The second paradigm of globalization—as manifested by the WTO and the rules set in the Uruguay Round—talks about liberalization and market access and assumes all countries to be on a level playing field. Thus we have the rules of competition, which are about market access for the powerful, the biggest, and the strongest. The one who gets there first gets the prize.

Then we have TRIPS. Today TRIPS is recognized across the board—even by those who promoted it 10 years ago—as a most protectionist instrument that has no place in a so-called free trade regime.

So, here we are, 10 years later, having seen the dominance of this form of globalization, which has three major characteristics. First, liberalization and globalization have shifted rule-making power from the national level to the global level, requiring a one-model-fits-all approach. No matter what people say, that doesn't always work. In reality, the one-model-fits-all approach is still applied, whether to technology, financial policy, macroeconomic policy, conditionalities in IMF loans, or to trade and investment. Its pervasiveness shows that it is a very strong paradigm. Shifting from the national level to the global level takes away domestic policy options. It takes away the kind of diversity of policy and practices that cater to different levels of development, not only among countries but within countries and societies.

Second, the rules very much favor the big economic players. We do not have any disagreement today that transnational corporate wealth—with its mergers, acquisitions, increasing control over every sector, including agriculture and food supply—has come into the hands of a smaller and smaller group. That has tremendous repercussions for global rules—which have gone out of balance between public and private interests—let alone the eradication of poverty and food insecurity. The rules are very biased against the poor and the small actor.

Thirdly, the state has retreated in that market-biased paradigm. In industrialized countries, privatization and deregulation became mainstream in the 1980s, and this rapidly spread to developing countries. Global rules such as those in the WTO accorded more rights and freedoms to the transnational corporate sector, while rules that protected the environment, the poor, and the vulnerable were weakened or dismantled.

Certainly the benefits of globalization are now openly admitted to be uneven and unfair. Thus we have a crisis of that sort of globalization, and we will need to do a few things to remedy the situation and help the poor.

We're told that increases in the demand for products in the developing countries, especially in Asia and the high-income developing countries, are a threat to food security. That idea brings us to the other facet of globalization, the globalization of consumption. It is no accident that people, once they have higher incomes, will want to eat more meat. The diet of unsustainable consumption and lifestyles is actively promoted. It is not just McDonald's. It is the whole notion, when we look in our textbooks as 6-year-olds in the South, that a picture of a glass of milk and a cow is what protein is all about. This is very strongly entrenched in the education system, in the way nutrition is being taught, in the way health is being taught, in the way consumption patterns have been globalized.

In the central area of health and nutrition, there is food and there is productivity. But food security and nutrition are not just a question of increasing productivity. In many cases, small farmers are very productive, and small farms are very efficient and productive, with high diversity and low inputs. Thus the question of continuing hunger is much more complex than productivity alone. Large areas of land are being shifted from food production to export crops, such as flowers and fruit for the wealthy. Huge areas of arable land are turned to tourism, mining, and industrial production, while agriculture and food security get very low priority. Environmental deterioration such as soil and water degradation threatens food production. Lack of land

rights and credit are major obstacles too. And where there is surplus food, those in need have no access.

So it is not just a question of increasing productivity. Commercial attention and much of the public subsidies are aimed at increasing the productivity of a few crops in the global food distribution system, which is controlled by a few corporations. That effort has put the trade of agricultural products in a prominent place in international discussions. The issues of agricultural trade in the WTO Agreement on Agriculture refer to a huge portion of global trade but ignore the majority of production by small farmers. The issue at stake goes way beyond the trade of a few food commodities and other products, to the fundamental concern of food and livelihood security.

We need to ensure that globalization does not make exceptions and boxes, but follows rules of global interaction and cross-border interaction that are dedicated to sustainability and people.

The challenge for those of us who are concerned with globalization is to make it work, and not only for the poor. We need to ensure that globalization does not make exceptions and boxes, but follows rules of global interaction and cross-border interaction that are dedicated to sustainability and people. The biggest challenge for developing countries is to integrate their economies into the global economy in ways that bring about sustainable development, economically, socially, and ecologically. That doesn't mean opening up completely and indiscriminately. Different countries have different experiences, whether Korea or Japan or Malaysia. Each country needs to control how investment comes into the country. While countries should seek foreign investment, they must also regulate where it goes and how it performs. The same is true with finance. Opening up quickly and indiscriminately creates vulnerabilities and instabilities. In Asia and many other parts of the world now (Turkey and Argentina, for example), we are learning the harsh realities of financial liberalization.

The clash of what globalization should and should not, can and cannot, do really is a question of the autonomy of a society within the state, that is, a question of how to reconcile the various parties in a society, each with different, often conflicting, interests. Sometimes the parties are confrontational because some of their interests conflict fundamentally. We cannot sit around the table when the players have unequal power—whether in one country or at the global level—and pretend we can come to nice agreements or consensus. When there are fundamental conflicts of interest, the state has to come in—in a very transparent, open manner—to balance the interests, or even to protect one over the other. That is absolutely crucial when agriculture, livelihoods, and food security are concerned.

In conclusion, we need to return to the spirit of the United Nations: cooperation, collaboration, and the participation of civil society. To get there, we should carry out honest, frank analyses and assessments. A good example are two recent and very informative reports by FAO that look at the impact of the WTO Agriculture Agreement on 14 developing countries: imports surge, food import bills grow, exports of commodities threaten natural resources, Northern markets erect barriers to developing countries' agricultural products, small farmers are affected, and so on.

Such data reaffirm that there should be no further extension of WTO into areas that have nothing to do with trade. The new round, aggressively promoted by the major developed countries to expand the scope and mandate of the WTO, is so contentious because some countries want to include more issues such as investment, competition, and government procurement. An examination of the rationale for this expansion shows that the new

rules proposed are predominantly about creating unfettered access by big corporations to markets everywhere. The new rules move into areas of core development policy, and this would open up land, services, public projects, and practically every sector of our lives to big corporations, tilting even further the unequal relations between domestic and foreign businesses, and between small farmers and big agribusiness. In that "competition" for resources (natural and financial), sustainable agriculture and food security stand to be severely marginalized.

Another crucial area for review is IMF conditionalities. Protests against liberalization did not start in Seattle. From the Philippines to Africa to South America, people have gone to the streets to protest against structural adjustments for years. Those conditionalities eat into the heart of macroeconomic development policies. In many countries, decades of IMF prescription have failed because of a one-model-fits-all syndrome. In the new crisis countries of Asia, countries that were once thriving, the same policy prescriptions caused economic and social havoc. In every case, IMF conditionalities cut away needed support to health and agriculture, and all the things that keep people out of poverty. Instead they created poverty. So let's get to reforming this area.

The issue of financial stability is absolutely central in a globalized world. Increasing financial crises underline the need for reform in the international financial system, including in the developed countries. Unfortunately, political will from developed countries is lacking. The issue of debt is an old issue, but it is becoming more and more of a burden. That must be dealt with too, or secure livelihoods and food security will remain a dream.

Many developing countries are working to try to change the global economic rules. The WTO-TRIPS agreement and the access to medicines is one such example. For agriculture, the issue of patenting of life forms is going to be the next big explosion in the WTO and other fora. Those of us who are concerned about agriculture and food security must get involved in this debate as well, because big business in the agricultural and pharmaceutical sectors devised the system of patenting and successfully made it into international law during the Uruguay Round negotiations. Their objective has been the control of seed, inputs, and product marketing, rather than food security and poverty reduction.

Finally, there is domestic policy, the right to make domestic policy. We need to swing the pendulum away from the market with all its inherent failures, back to the democratic state in order to tackle globalization, and to make it work for us as people.

In 2002 we will have a wonderful opportunity in Johannesburg to really reshape globalization, not just tinker with it, but change the fundamental rules if we dare to do it politically.

Robert L. Thompson
Director of the Rural Development
Department of the World Bank

What needs to be done to shape globalization such that it benefits the poor and contributes to ensuring their food security? I want to address this question in two parts: first the global issue, then the national issues within the developing countries themselves.

At the global level, low-income countries, particularly those which are principally dependent on agriculture, have benefited relatively little from past international trade negotiations. The agricultural sectors of low-income countries and the farmers who tend to be the lowest income members of their society (70 percent of the poor live in rural areas, and most of them are farmers) tend to be hurt severely by OECD country agricultural subsidies and trade policies. According to OECD estimates last year, subsidies by OECD country governments to their farmers approached almost $1 billion per day. That has to distort international markets for agricultural products and artificially depress the

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prices of commodities to farmers around the world and particularly to low-income farmers.

Also, the binding import quotas agreed to in the Uruguay Round tend to cause greater volatility of international market prices. So the policies of the high-income countries both depress prices to farmers in developing countries and increase the variability of those prices. The WTO negotiations that have already started in agriculture and will be continuing after Doha should address frontally the issue of reducing OECD protectionism. OECD countries need to reduce tariffs, particularly the tariff peaks. They need to reduce the cascade of protection that makes it difficult for developing countries to add value to the raw products of their land. And they certainly need to base SPS barriers to imports on good science so that they're not used simply as protectionist barriers against products from developing countries.

A second global issue relates to the fact that agriculture and food security have fallen off the global agenda. Most bilateral donors have significantly reduced their investments in agricultural development in low-income countries over the last 20 years. Lending by the World Bank for agriculture and rural development has fallen significantly over the same 20 years and, in fact, last year reached the lowest level in the history of the World Bank. This is completely unacceptable if we are serious about increasing food security in developing countries and reducing poverty. If we can't increase the incomes of farmers, particularly the small farmers of the developing world, we won't solve the problem of poverty in those countries or achieve the international development objectives.

Why have the issues of agriculture, food security, and rural poverty fallen off the agenda? Low international commodity prices have contributed. It is hard to get a decent return on investment in an agricultural project when prices are so low. More important, the rural poor simply have little if any political voice in most developing countries. Political power is concentrated in the cities, and most developing countries' own development policies, as well as those of the donors, tend to have a pronounced urban bias. As a result, most of the benefits go to urban areas. Poverty reduction efforts tend to focus on the urban poor, and the majority of the poor—the rural poor—fall further and further behind.

Lending by the World Bank for agriculture and rural development has fallen significantly over the same 20 years and, in fact, last year reached the lowest level in the history of the World Bank.

A third area under the global environment is international agricultural research investments. There is a large public good character to agricultural research. Investments in agricultural research have a particularly beneficial effect on the poor. Such research can keep the price of food low for urban consumers. At the same time, increasing productivity and lowering the cost of production of low-income farmers increases both their earning potential and their ability to efficiently produce a food supply for their urban brethren.

However, investments in agricultural research by bilateral donors, as well as by many international organizations, have dropped significantly—in fact, more than proportionately to investments in agricultural development in general. This is extremely shortsighted not least because the private sector—which is conducting much more of the international agricultural research today than formerly—is mainly addressing problems of high-income farmers in high-income countries, not farmers in low-income countries. We have cut back too far on the public investments in agricultural research that are desperately needed to solve

the problems of low-income farmers in low-income countries.

Turning to the national level, developing countries themselves need to act to help ensure that they benefit from globalization. Trade can be a powerful engine of growth and poverty reduction, but it doesn't happen automatically. Developing countries have to enhance the competitiveness of their potential exports and also of goods they produce for their own consumption to compete successfully against imports.

As I mentioned before, developing countries' own policy environment tends to have a pronounced urban bias. Their policies have tended to turn the terms of trade against their own farmers, artificially reducing the price of goods that the farmers produce and sell. Developing countries have also had a pronounced urban bias in public investments in roads, telecommunications, electrification, schools, health, and all the other necessary conditions for successful development.

In the jargon of WTO and the General Agreement on Tariffs and Trade (GATT), developing countries have significantly underinvested in green box measures. Green box measures are legitimate investments by government in infrastructure, human capital, marketing, information services, inspection services, agricultural research, and agricultural extension. All the high-income countries of the world invest significantly in these areas. Most low-income countries are grossly underinvesting in these same areas, and they cannot be internationally competitive unless they redress this underinvestment.

Unfortunately, bilateral donors, as well as international lending institutions, have reduced their investments in the very areas that are necessary for low-income countries to successfully compete in international markets. These investments are very much needed to create an environment suitable not only for agricultural development but for international competitiveness.

What can we conclude from this analysis? Certainly, both gainers and losers result from opening up markets and liberalizing trade. Too often in the past we have argued that the gains of the gainers exceed the losses of the losers, and therefore, society ends up better off from liberalizing markets. One of the important changes in the World Bank in the last five years and in much of the international community has been the acknowledgment that, if there are losers from liberalization, they need to receive adjustment assistance. There need to be investments to increase their competitiveness and to create social safety nets, particularly when the losers are among the lowest income members of society, often the rural poor who are left further and further behind.

A larger fraction of international investments should be targeted to pro-poor measures to help them catch up and to help meet poverty reduction targets by reducing the number of poor living in rural areas. The World Bank is in the midst of reviewing and updating its rural development strategy. The principal objective of this review is to increase the focus on rural poverty alleviation and at the same time increase food security.

By addressing poverty, it is possible to make a significant impact on household-level food security. We also have to be sure to address food security at the global level. The demand for food in the world is expected to double in the next 50 years from a combination of population and income growth, but we have at most 10 percent more land to grow it on. And agriculture will probably have trouble keeping access to as much water as it has now. We face a tremendous challenge in increasing productivity—not only to solve the problems of rural poverty but also to solve the problem of food security in the long term.

Ango Abdullahi

Special Adviser to the President on Food Security, Nigeria

The general principles of globalization and food security have been well covered. I would therefore like to use Nigeria as a case study of the experiences of developing

We have cut back too far on the public investments in agricultural research that are desperately needed to solve the problems of low-income farmers in low-income countries.

countries, especially in the last decade or so.

Perhaps you sometimes hear of Nigeria's potential, its population of 120 million, its oil-producing states and membership in the Organization of Petroleum Exporting Countries (OPEC), and so on. You might get the impression that this is a rich country. Nigeria is not a rich country. It is a poor country given the size of the population and is actually among the 25 poorest countries in the world today.

When Nigeria signed the WTO agreement about six years ago, Nigerians, like the people in many developing countries, were very enthusiastic about this new opportunity. It was seen as a chance for developing countries to move up much faster than they were moving at the time and to address the serious questions of poverty and general insecurity—including food insecurity—around the world. Now, at least in Nigeria, we have moved from enthusiasm to skepticism and, in fact, to cynicism about globalization, particularly as it affects developing countries like Nigeria. It looks to us as though the standards are not equal standards. In fact, the playing field is not level at all. There is so much inequity in the system that it is extremely difficult for truly developing countries like Nigeria to benefit from globalization in terms of tackling its basic problems of poverty and the insecurities arising from poverty.

Globalization should address four main areas: trade, investment, transfer of technology, and development assistance—and perhaps, related to this, debt. At the moment the emphasis appears to be on trade. And all the rules that have been worked out appear to favor the stronger countries, the more developed countries, against the interests of the developing ones. In fact, trade really is the emphasis. You hardly hear serious discussions about investments.

If you're going to move people out of poverty, you need to create opportunities for employment. How can this be done unless you develop areas of industrialization? If developing countries are expected to produce raw materials and, for that matter, selected raw materials that attract special prices, then of course there would be no question about investment opportunities and job opportunities in these countries. There is no way to create job opportunities without industrial development, which for developing countries should be tagged on to agricultural raw materials. At the moment investment is not being addressed. But if we're going to be serious about getting all the stakeholders to participate in globalization, the issues of investment must be addressed.

As for technology, a lot of problems are developing, particularly in the areas of agricultural research, biotechnology, and so on.

Of course, when you come to other issues of global concern—poverty and so on—many questions arise. How do you go about reducing poverty? How do you deal with the situation today where the daily subsidy to agriculture in OECD countries is about $1 billion per day, amounting to more than $360 billion a year—more than the total combined budgets of African countries south of the Sahara?

For countries like Nigeria the rules have to fit the needs. In Nigeria, 70 percent of the population depends on agriculture. Millions and millions of small-scale farmers typically hold one or two hectares. The state has no role in getting them to be more efficient and more productive so that they can compete with organized, highly sophisticated farming enterprises, ranging from several thousand hectares to corporate organizations that compete around the world. Yes, we should compete, but then the bases of competition have to be clearly understood and appreciated in terms of the responsibilities of the countries that are dealing with underdevelopment and poverty within their borders.

Through either IMF or World Bank conditionalities, we're told fertilizers for farmers in Nigeria can't be subsidized. Certainly, I reject that because it is inequitable. We're told we can't create institutions that will make it possible for small-scale farmers to borrow at lower interest rates than the commercial banks are offering. How can a farmer borrow at 25 percent interest and invest in agriculture and make

If you're going to move people out of poverty, you need to create opportunities for employment.

a profit? It's not possible. I don't think it happens anywhere in the world. We must have some allowances for us to look into our peculiar situations within the global context. And the global world must understand that for all of us to move in the same direction, the rules must allow for serious concerns that arise from specific situations. Especially the stronger stakeholders in the system of globalization must understand this. If we remain poor, what are we going to buy from you?

These issues must be considered in proper perspective, short-term and long-term. No doubt we have a lot in common. There is lots of genuine concern around the world that development should take place, that the playing field should be as level as possible, and that we move forward in a state of harmony.

Discussion

The intense discussion on putting globalization to work for the poor included a variety of topics, from market opening and agricultural research to the organization of farmers and more on the role of the WTO. A participant made a poignant remark about the level of caution with which speakers and participants from all backgrounds approached globalization. He noted that the presentations raised several challenges: liberalization causes unmanageable import surges, small farms cannot compete in international trade and must be subsidized, and safety nets absolutely must be in place before liberalization happens. Robbin Johnson pointed out that fears of globalization express a great deal of worker anxiety in both developed and developing countries. Attitude surveys show that the anxiety is typically present not among the very rich or the very poor, but rather among middle-income groups in both developed and developing countries. It is these groups who feel most threatened by the kinds of transformations that globalization requires because they have something to lose. They are fighting desperately not to have to make the changes required of them and to preserve the benefits they have in the current system. The insecurity is not necessarily something that is felt at the bottom end of the socioeconomic ladder. A closer look at the politics of globalization, Johnson added, might reveal a parallel between the political bias against rural areas and the political bias against the poor that reflects middle-income insecurity about the changes brought about by globalization.

A second key topic of discussion was the mobilization of farmers. A participant suggested that to solve the food security problem, there is a need to motivate and mobilize farmers to form organized farmers' unions and agricultural cooperatives so they will be active participants in the development process. When the participant asked Robert Thompson for reassurance that this is a priority at the World Bank, he responded that the World Bank has active programs to enhance the political clout of farmers by helping to create or strengthen farmers' organizations to lobby more effectively. Moreover, one question the World Bank is asking is why agricultural marketing cooperatives have not played a greater role in agricultural development in low-income countries, as they did in northern Europe, North America, and Japan at a

similar point in their agricultural development.

A participant raised the issue of opening markets, noting that about 90 percent of all food is produced locally for local consumption, while about 10 percent flows across borders. He referred to the previous day's presentation, which suggested a possible massive increase of cereal imports into India and China and wondered whether that gain can be handled with the present degree of market opening or whether it will result in massive disruption of the market. In response, Johnson said that the high degree of agricultural protection and subsidization and the use of nontransparent trade measures like tariffs or minimum price guarantees have two effects on global prices. One is the tendency to depress prices below where they would be in the absence of those protections, and the second is to destabilize prices, making the product open to more violent price swings. In a global food system, Johnson continued, not only will the flow of commodities increase, but it will do so in two different directions. He suggested that more land-intensive commodities, such as grains, fibers, and animal products, ought to flow from land-intensive countries to more densely populated countries, while, in turn, more labor-intensive commodities, value-added commodities, processed agricultural products, and fruits and vegetables should flow from densely populated countries to some of the land-intensive countries. Resources would be used more efficiently, and small farmers would have access to cheaper inputs and higher-paying markets, raising their living standards.

Following up on the earlier comments, a participant asked Thompson why development agencies are cutting back on the research on agriculture that would make the sector more competitive. Thompson pointed out that as resources for official development assistance have been cut back in the last decade or two, a new agenda of issues, such as environment, AIDS, corruption, governance, and gender, have also been claiming more resources and thereby squeezing out agriculture. Low international commodity prices also give a false impression that there is no food production problem. He added that the World Bank, like many bilateral donors, has decentralized and moved the locus of decisionmaking to the national capitals to get closer to the client. But the lack of political clout in rural areas leads to a lack of perceived demand for agricultural and rural development projects from developing countries. Thompson urged developing countries themselves to place a higher priority on agricultural and rural development. If they do, and if they reflect those priorities through the poverty reduction strategy papers, for instance, then the bilateral donors and international lending institutions would likely respond by making more money available.

When asked what can be learned from Malaysia's approach to globalization, in particular its position vis-à-vis the IMF, Chee Yoke Ling responded that Malaysia was cautious and did not liberalize its financial sector as much as other countries in Asia did. Questions of ecological sustainability and balance of payments due to overdependence on foreign investment had been emerging internally. Yet the overwhelming ideology of market economics was too powerful. After the crisis Malaysia followed the IMF package for the first few months, as it was the mainstream remedy, but it did not work. Then, mainly thanks to strong political leadership, the country tried different solutions. The other key ingredient was knowledge.

Debt, conditionalities, and international obligations can lead to a loss of policy options at the domestic level. Therefore, although more investment and more aid are needed, countries must have freedom of choice. Ling added that there is not enough exchange of experiences at the international level, especially among developing countries.

Other issues arising from the discussion included the need for global governance, the need to change immigration policies to benefit the poor, and the need for a Marshall Plan for Africa. A participant made a plea for global governance, noting that it can provide a level playing field, instill human dignity, and help overcome the inequities within developing countries. The participant added that the international community can play an important role by influencing heads of state, which a country's own citizens often cannot do. Another participant argued that globalization is one reason why the ambitious goal of the Conference may not be achieved. The developing countries are far behind, and in order for them to jump ahead to a level that is acceptable, massive funding would need to be injected into the least-developed countries. This participant called for a Marshall Plan for Africa.

Because some discussion related to the WTO, the Chair asked Supachai Panitchpakdi to add his comments. Supachai emphasized the importance of close and constructive work among agencies to harness globalization. Examples include the Globalization and Social Issues working party of the ILO, and the WTO and World Health Organization (WHO) collaboration on TRIPS and the accessibility of HIV drugs. Supachai promised to try to find ways to work with FAO to look into the sustainability of food security. He also mentioned the need for clear priorities and suggested focusing on helping the 49 poorest countries first. He praised the Everything but Arms program of the European Union for providing open, coda-free, tariff-free access for goods coming from the 49 poorest countries and encouraged the EU to phase out the exemptions for rice, bananas, and sugar as soon as possible. Supachai stated that the WTO would need more staff and resources in order to harness globalization for the benefit of poor countries, but he also noted that he was not going to turn the WTO into another development organization.

In closing, the Chair, Isher Judge Ahluwalia, reiterated that the concern about globalization expressed during the discussions was a heartening indication of maturity and that sides were coming together toward a middle ground to find a way to manage the process.

Chapter 12

The Long Arm of Industrialized Countries: How Their Agricultural Policies Affect Food Security

Chair: Wen Simei

Professor, Institute of Economic Development,
South China Agricultural University

I want to speak about the global agricultural economy and the importance of food security.

I grew up in the Asian paddy rice economy. During my childhood I witnessed many of my young friends living in hunger either because of insufficient food supply or because they lacked the purchasing power to buy enough food. When I first entered the discipline of agricultural economics 25 years ago, my professor told me there were about 800 million people living in hunger globally. A quarter century later, that figure has not changed, and, unfortunately it will probably increase.

What have we done so far to end hunger? Last year I talked to a Chinese small farmer who cultivated half a hectare of sloping semiarid land. His crop yields had increased by about 10 percent, but crop price had decreased by roughly 10 percent and input price had increased by about 5 percent, so he now earned less farm income than before. He asked, "So, how can I make enough next year?" I asked him what he needed. He said, "Well, nothing but a revolution." I told him, "This is not the age of revolution. This is the age of globalization." Then he asked me, "Who invented that damn word, globalization? It must be someone who lives in the developed countries without any experience of hunger."

That is a real story. Today, we have many distinguished experts working in this field, discussing how industrialized countries' agricultural policies affect food security in developing countries. They will tell us stories, ask questions, and, we hope, provide solutions to the problems.

Alex McCalla

Professor Emeritus, University of California at Davis

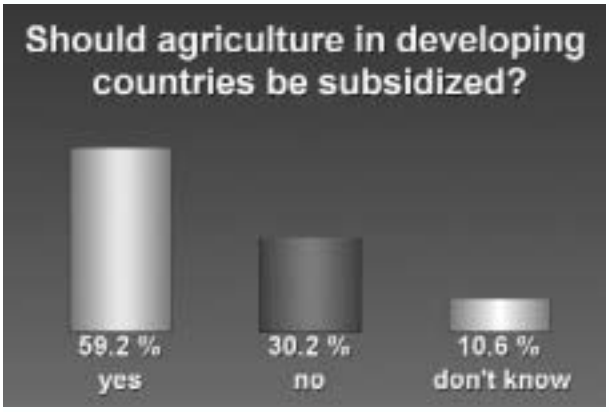
I thought that I would come to this session and present a new and important message: that the kinds of policies pursued by developed countries, particularly OECD countries, have very negative effects on food security and economic growth in developing countries. But my comments now follow and very much support the remarks of the Prime Minister of Uganda and the German Minister for Economic Cooperation and Development. They and many others have pointed out that the policies pursued by developed countries do have potentially negative impacts on developing countries.

We have gone through a major swing in development paradigms over the last 15 years. We have swung from the notion of inward-looking import substitution policies, in which agriculture played a very limited role, to a more open economy, export-led-growth model. In that model, agriculture ought to play a leading role, particularly in countries where it remains the dominant economic activity. And yet agriculture does not play such a role in most instances.

We have heard many propositions to explain this situation: a lack of appropriate technology, overpriced input supplies, inappropriate sector and macroeconomic policies, inadequate investment in public goods, and so on.

But very infrequently are the conditions in international markets identified as a constraint to

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

the role that agriculture could play. I submit that the policies in many rich countries, OECD countries, which protect and subsidize domestic agriculture, are major culprits holding back agriculture-led growth in many poor countries.

How can this be the case? Let me tell you the ways. It is an anomaly to me that domestic agricultural policy in rich countries heavily subsidizes a declining agricultural sector, which, at maturity, contributes less than 5 percent to GDP, while in poor countries, where agriculture is the dominant sector, agriculture tends to be heavily taxed, directly and indirectly.

Why should this be the case and who should care about it? In a world not connected by trade, the issue of how much developed countries subsidize agriculture would be an issue mainly for domestic developed-country taxpayers and consumers, with one concern being that large subsidies go to fewer and fewer already well-off large farmers. But in an open, globalized economy where most countries are linked by trade, agricultural subsidies in developed countries become a major issue for poverty reduction and food security in developing countries.

Rich countries have pursued, for many years, the objective of supporting farmers' incomes, and they have done that by supporting farm prices. If you are an exporter, this is a complicated issue. If you are going to support domestic prices by guaranteeing high internal prices, you have to either engage in export subsidies accompanied by border protection or make direct supplemental payments to augment the domestic price. In either case it requires the involvement of trade policy in conjunction with agricultural policy. The higher prices encourage production and discourage consumption, necessarily leading to increased exports, which, when put on the international market with subsidies, depress world prices and increase price instability, the point made by both Bob Thompson and Rob Johnson.

For the importer life is a bit simpler. Simply managing the border allows you to raise domestic prices, which increases production, decreases consumption, reduces imports, and puts downward pressure on world prices. Eventually high internal prices may encourage domestic production to such an extent that importers become exporters and begin to dump commodities on the world market with the help of export subsidies, further depressing world prices. Do those scenarios sound familiar to you? Do they sound possibly like the United States and the European Union?

What are the consequences of such policies for developing countries who are trying to pursue an agriculture-led growth and development strategy? They are significant. First, developed-country policies clearly depress world prices. That hurts developing-country exporters of the same products—cereals, for example.

But shouldn't it be good for food-importing countries to have low international prices? The answer is, in the long run, probably not. Yes, it saves foreign exchange in the short run. Yes, it may absolve countries from investing in their rural and agricultural sectors, but clearly this is a shortsighted policy for countries with significant agricultural sectors. Maybe it's okay for Hong Kong and Singapore, which have no agricultural sector, but it may be a debilitating policy for a country with a majority of employment still in the rural sector.

Second, low global prices dampen domestic incentives to improve agricultural productivity, which is absolutely critical if poor countries are to get out of poverty. But the problem is worse than that. Most countries have produced and will continue to produce the vast majority of their own

food supply. On average, developing countries produce 90 percent of the food they consume. Therefore, to feed 2 billion more people, you have to improve the productivity of the farming systems in those countries with increased populations.

Third, if agricultural profitability is the key to poverty reduction, then deliberately depressing world prices by subsidizing rich-country farmers is simply a bad policy for poor countries. But, you say, poor countries are in the tropics and subtropics, and rich countries are in temperate zones. Therefore, there isn't an overlap of commodities. But this is untrue because wheat, rice, and maize—the major sources of calories worldwide—are produced in both sets of countries. Developing and developed countries also compete in markets for fruit, vegetables, livestock, and fish products. Even if these products have the potential to spark export-led growth, they run hard up against import barriers in developed countries. Worse still, domestic processors in rich countries are protected by tariff escalation. That is, there are increasing levels of tariff protection for increasing levels of processing.

There are still further consequences. The lack of export markets reduces foreign exchange earnings, making it more difficult for developing countries to get out of debt. And domestic price support policies and accompanying border control in developed countries allow them to export their domestic instability and reduce their need to adjust to international instability, thereby increasing the instability of international prices. Finally, even when rich countries agree to "decouple" payments, direct payments of the sort and magnitude used in the United States over the last two or three years undoubtedly have an impact on production levels and prices. These payments are not completely decoupled.

Overall, it is sort of a sad story, isn't it? One might have believed that in the 1990s things were beginning to point in the right direction. The final Agreement on Agriculture in the Uruguay Round appeared for the first time to bring agricultural trade under the rules of GATT. And the new round, which was going to begin in 1999, would press forward with reducing barriers to trade. Also, the U.S. Freedom to Farm Act seemed to be heading, in 1996, in the direction of lowering farm policy expenditures and phasing out farm programs by 2002. And finally, there seemed to be movement in the EU, under budgetary pressures, toward a commitment to reducing support and cutting export subsidies.

And yet in 2001 none of these things seem fully on track. The Seattle debacle has shaken the WTO, and decisions about another round have been delayed, even though technical discussions on agriculture are taking place. The U.S. Congress and two administrations, Democratic and Republican, have thrown enormous sums of money into agriculture to compensate for low agricultural prices. Proposals being floated for new farm legislation, for 2002 and beyond, seem headed back toward more, not less, government involvement in agriculture. And there is no obvious evidence yet of significant reductions in expenditures on export subsidies and the Common Agricultural Policy in the EU.

Nevertheless the inescapable conclusion remains that reductions in subsidies for rich-country farmers would be a boon for many developing countries. Lower subsidies would lead to higher and more stable world prices, improved world incomes, and increased food security.

Will that happen soon? I used to be an optimist about policy reform in developed countries. What evidence do I have now to continue to be optimistic about seeing true reform around the corner? I thought I saw it in 1996, but it didn't happen. I guess I'm becoming somewhat more pessimistic in my old age. Perhaps the most important, but difficult, political task ahead for improving global food security is to get government out of agriculture in rich countries. But there is little evidence that this is going to happen very fast, if at all.

Perhaps the most important, but difficult, political task ahead for improving global food security is to get government out of agriculture in rich countries.

Shishir Priyadarshi
Agriculture Consultant (WTO), South Centre

I have but two brief introductory remarks. First, the South Centre, which is based in Geneva, is an intergovernmental organization that is entirely member-driven. Though about 45 developing countries are members of the South Centre, the center is mandated to assist and interact with all developing countries. So a lot of what I have to say today in fact reflects what these countries have expressed, both about the concerns that they have with the Agreement on Agriculture and the expectations of the new negotiations. Second, I shall be looking and analyzing these issues entirely from a WTO perspective, because I would like to examine the impact of some of the policies of the northern countries from such a perspective. The four major components of agricultural policies for industrialized countries in the context of the WTO are domestic support, export subsidies, tariffs and market access, and non-tariff barriers. I will try and briefly explain and analyze the impact that some of these policies have on the developing countries.

...we need to focus on how we can shift, directly or even indirectly, the kind of support presently provided by the richer countries into more productive means of reducing hunger and poverty.

The first component is domestic support. We have heard more than one reference to the large amount of support that OECD countries provide to agriculture, nearly a billion dollars a day. But what is its impact on developing countries? Needless to say, these high levels of domestic support lead to excess production in developed countries, which, in turn, depresses world prices. Then depressed world prices reduce the profitability of developing-country exporters, which, in turn, leads to loss of incomes and livelihoods in developing countries.

I must share with you some of the reactions of delegates from the poorer developing countries, particularly the net food importers, about this support of nearly $1 billion a day. FAO estimates that there are about 800 million food-insecure people in the world. A large number of countries feel that if we can divert this $1 billion a day to the approximately 1 billion people who are undernourished, that is a dollar a day per person, then that would actually solve the food-insecurity problem. Therefore, we need to focus on how we can shift, directly or even indirectly, the kind of support presently provided by the richer countries into more productive means of reducing hunger and poverty.

Export subsidies, the second component of agricultural policies in developed countries, have exactly the same kind of effect. A large number of developing countries are prohibited from using export subsidies because they were not using them when the agreement came into force. On the other hand the agreement allows a number of developed countries to provide such support to their agricultural exports, support which allows developed-country exporters to capture more than their fair share of the market. This drives out the otherwise more competitive exporters from developing countries and again leads to loss of income and rural livelihoods.

I would therefore classify both domestic support and export subsidies as agricultural subsidization, because the impact is really the same. Both lead to a reduction in domestic production in developing countries either because these countries are unable to export and therefore produce less, or because the subsidized, cheaper imports suppress domestic production.

In either case the reduction in domestic production invariably leads to increased food insecurity, which, in turn, because of lower production and productivity leads to reduced rural incomes and therefore increased rural poverty.

Perhaps most fundamentally and most importantly, domestic support and export subsidies have very often led to a long-term and permanent adverse effect on domestic production systems in a number of countries, particularly in Africa and South Asia. This directly affects the food security situation in these countries because they then become increasingly dependent on food imports without having the means to pay for them.

The third pillar of WTO policies that negatively affect developing countries is the whole issue of tariffs. When the developing countries signed on to the Agreement in Agriculture, they were assured of market access for their agricultural products in developed countries. But because of tariff peaks and tariff escalations—and in spite of developed countries having fulfilled their commitments on tariff reductions—market access has not been achieved. In the coming round of negotiations, this will remain one major issue: how to ensure actual tariff reductions and do away with tariff peaks and tariff escalations, so that products of export interest to developing countries can gain entry to developed-country markets.

The fourth pillar is like an invisible pillar. Tariffs are very often known to exporters who can perhaps plan accordingly. But nontariff barriers, in the WTO parlance, have affected developing-country exports even more negatively than tariffs. Each nontariff barrier could be the focus of a lot of discussion. But suffice it to say that a lot of these nontariff barriers go against the very grain of the public pronouncements that these countries make about globalization and liberalization, as well as against the context of a new round. It is exactly these nontariff barriers that are limiting exports from developing countries.

Irrespective of the kind of policies that a lot of northern countries are following, domestic agricultural production and rural incomes do fall in developing countries. And when rural incomes fall and there is a shift away from the traditional agricultural systems, we have reduced access to food. That, in turn, leads to migration from the rural areas.

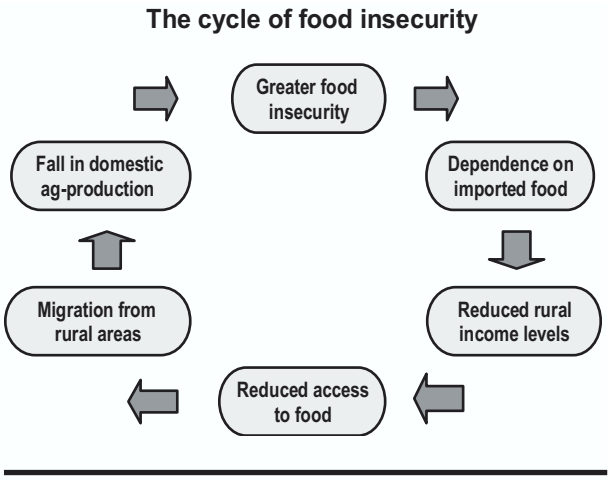


FIGURE 1

Now, this whole cycle is not easy to get out of (see Figure 1). Each part of the vicious circle tends to strengthen the other parts. Once you become dependent on imported food, you are led further away from your domestic production systems. Developing countries often face this situation.

In Geneva, where South Centre is based, you can ask any developing-country delegate what is the most important issue on the horizon. Nine out of 10 will talk of the agricultural negotiations because such a large percentage of their population is based in agriculture. It's a huge contributor to the gross domestic product of these countries, to rural employment, to export earnings, and, in effect, to food security.

Negotiators have tended to identify three broad areas where they really need changes and amendments to existing provisions. The first is protection from cheap imports. Trade distortion arises from the kind of domestic support and export subsidies being provided by northern countries and results in cheap produce coming into developing-country markets. Developing countries do need protection from cheap imports.

The second broad area is free and fair market access, which is directly related to the kind of tariff and nontariff barriers developing countries face. They need a fulfillment of the promises made during the Uruguay Round.

The final area is the flexibility to support and protect small farmers. Some have said that there are adequate provisions but not adequate finances. I beg to differ. Paragraph 2 of Annex 2 of the Agreement on Agriculture is perhaps the only paragraph that permits a little flexibility to developing countries. All the other 12 paragraphs are entirely geared toward policies and the kind of programs followed in the North. Therefore we need changes. Yes, resources are a constraint, but we do need changes.

If we can make these three changes, then we should be able to achieve sustained rural employment and better livelihoods, the preservation of small and marginal farmers, increased domestic productivity and production, increased food security, and increased rural incomes.

We at the South Centre have converted these recommendations into a proposal for a development box for developing countries. Seventeen developing countries have jointly submitted that proposal to the present negotiating process.

Discussion

Time constraints allowed for only three comments from the audience, but they were thoroughly discussed by the two panelists. The topic of discussion was subsidization, either through food aid or agricultural subsidies in developed countries. A participant stated that the speakers had made no explicit mention of the role of food aid and food security. It was discussed implicitly as a form of subsidy in that some industrialized countries purchase food and send it overseas, but how does food aid explicitly affect rural farmers, and what should its role be? Alex McCalla responded that food aid has a legitimate role in natural or man-made emergencies. As a mechanism for disposing of surpluses from developed countries, however, or for transferring capital or income for development, it is bad policy and an inefficient way of doing development. Therefore, food aid has a limited role. The challenge is to learn how to maintain food aid's critical role in emergencies in an environment of nonintervention or less intervention by developed countries. Shishir Priyadarshi added that in spite of the fact that food aid has obviously played a significant role over the past five years, especially in the net importing developing countries, members of the WTO have raised important concerns about food aid. First, whenever world prices have been high, food aid has dried up. Second, food aid is rarely demand driven; it has not been given when countries have wanted it nor has it been in the form in which they wanted it. The net food importers have proposed creating a food aid fund from which countries in need could borrow to overcome their food crisis and which they could then repay. It is unfortunate, Priyadarshi concluded, that the net food exporters, the major subsidizers, have not yet agreed to the establishment of the fund.

The second comment was on the role of agricultural subsidization in developed countries. A participant pointed out that many people claim that for all the evils of agricultural subsidization in developed countries, it does keep prices low for the great majority of

the poor in developing countries who are net food buyers and food consumers. Although this is not an overriding argument, there are still questions to be asked. What is going to be done about the poor who find the price of their food increasing as a result of recommended policies? What is going to be done about food aid quantities, which may be depressed when agricultural subsidies end in the West? McCalla agreed that increasing food prices for the urban poor or the nonagricultural poor is an important issue, and others throughout the Conference raised the need for safety net mechanisms before liberalization. Nonetheless, the majority of the poor in the developing countries are rural, and increased prices benefit the rural poor as much they hurt them. If the productivity of those small farmers improves, lower prices will not necessarily lead to lower incomes but rather could lead to higher incomes.

A participant from an umbrella organization whose members include developing-country farmer organizations stated that farmers are hurt by subsidies that distort markets, like export subsidies, but that there is a need to differentiate between subsidies that distort trade and those that do not. In the food chain, four retail chains control global retail markets with four clusters of input suppliers, and there are 2 billion farmers. If subsidies to farmers are abolished, will prices go down? If the wheat harvest is poor, the price of bread will rise, but when the price of wheat goes down, the price of bread does not come down. If the subsidies are taken away from the farmers, it will hurt their income, but it will not benefit the consumers by lowering prices in the supermarkets. So why are we doing it? Priyadarshi agreed that if we can differentiate between trade-distortive and nontrade-distortive subsidies and ensure that all subsidization is nontrade distortive, it would be a big step forward. McCalla responded that the major issue is whether or not the industrial structure, in terms of concentration, will pass on changes in the cost of production to consumers. He continued that he is less concerned about the number of firms than he was 20 years ago. Now he is concerned about whether opportunities for competition exist in the market. Making production of a variety of products more profitable for farmers in more countries, where there is not a concentration of power in terms of retailers, wholesalers, or input buyers, should increase competition in the world market, not decrease it. Therefore, reducing subsidies for farmers in rich countries could make it more profitable for farmers in developing countries to produce more and be more competitive in international markets.

Chapter 13

Promoting Broad-Based Economic Growth and Food Security: A View from the European Union

Chair: Per Pinstrup-Andersen
Director General, International Food Policy Research Institute

Per Pinstrup-Andersen's remarks consisted of a short introduction to Poul Nielson, which can be found at the end of the volume in Appendix 2.

Keynote: Poul Nielson
European Union Commissioner for Development and Humanitarian Aid

With close to 800 million people still suffering from hunger and malnutrition, the attention given to food security at this conference is a moral imperative. Five years ago, the World Food Summit set a target of reducing the total number of undernourished people by half no later than 2015. We are not on a path to reach that target. In the run-up to the five-year review of the World Food Summit, it is time to take a critical look at our policies and actions. And so, I would like to outline my vision of food security and the actions that need to be taken by the international community and national governments.

In the view of the European Commission (EC), the best way to achieve food security for all is to implement a broad-based policy for sustainable growth and poverty reduction. Economic growth is a necessary condition for food security because it contributes to increased food production and a strengthened external trade position, which allows countries to import food if necessary. However, growth is not a sufficient condition for food security. Above all, it is essential to strengthen people's access to food by tackling poverty.

To bring about food security, we must therefore deliver growth with poverty reduction and equity. We must ensure that the poor are included in growth. That requires actions to develop markets, institutions, and infrastructure that are accessible to the poor, and to provide sustainable services focused on public goods.

In addition, we must give greater prominence to tackling the inequalities that are the bases of poverty and hunger. We cannot expect growth to deliver poverty reduction when there are large inequalities in human capital, employment, access to land, and other productive assets. We need to confront these inequalities by addressing issues of land tenure and land reform, generating employment, providing universal access to health and education services, making rural credit more available to those lacking collateral, and tackling policy biases that disadvantage the rural poor. This includes addressing the lack of political participation and empowerment of the poor.

The EC's policy on food security reflects these principles. Food security is treated as an integral part of a comprehensive strategy for poverty reduction. That is why the new overall development policy of the EC focuses on poverty reduction as the overarching objective but includes food security as one of the six priority areas where the EC will concentrate its support. Food security is therefore at the heart of the EC's approach to poverty reduction.

The limited progress that has been made in reducing hunger tells us that it is not sufficient to

tackle food insecurity by focusing on food availability and production, and by relying on aid. We have to build coherence with trade policy, macroeconomic management, regional integration, key economic and social sectors, environmental concerns, and, indeed, the domestic agricultural policies of countries in the OECD. Above all, we need to tackle the important political dimensions of food insecurity by giving greater attention to promoting democracy and good governance, preventing conflict, and building peace.

The European Union (EU) can make an important difference in all of these areas. The EC and the EU member states provide more than half of the development aid in the world. At the same time the EU is the main trading partner with developing countries, the second largest food exporter, and a significant political body. This gives us an important opportunity and responsibility to ensure greater coherence in our approach to food security. Some examples illustrate this point.

One area that has seen tremendous progress in strengthening coherence over the past two years is the link between EU trade policy and development policy. Several initiatives have sought to increase developing countries' access to EU markets. The flagship policy is the Everything but Arms initiative that has been in force since March this year. It ensures unrestricted, duty-free access for all products from the LDCs to the EU, except for arms. The initiative is designed to strengthen the trading position of the LDCs and is a key element of improving food security in the poorest countries. Following the lead of the EU, and the call from the third UN LDC conference in Brussels in May this year, other developed countries have signaled their intention to implement similar measures.

Improving market access alone will not be enough to stimulate major export growth from the LDCs. We must also address the competitiveness constraints these countries face. The EC is supporting numerous programs to enhance the production and trading capacity of developing countries, and their ability to attract investment.

To bring about food security, we must therefore deliver growth with poverty reduction and equity.

For many of the poorest countries, the competitive forces of the world market are beyond their current capacity. Regional integration is an important step on the way to competing in the global market. The EU has supported numerous regional integration initiatives. The Cotonou Agreement is a landmark agreement, comprising the EU and 78 developing countries. It will provide for free trade areas between the EU and regional groupings of ACP states (African, Caribbean and Pacific Group of States), referred to as Economic Partnership Agreements.

Finally, on the subject of trade, it is important to mention that the EC has been a major force in gathering international support for a new round of WTO trade talks and has been calling for an agenda that emphasizes the concerns of developing countries, including food security.

Food aid is another area where we have made great progress in developing a coherent approach to food security. I can categorically state that EC food aid policy no longer has anything to do with the dumping of agricultural surpluses stemming from the Common Agricultural Policy. We only provide food aid in specific situations where it is the most appropriate instrument to tackle nutritional problems and food shortages. The sole objectives of EC food aid are to save lives during emergencies, to provide safety nets for vulnerable groups, and to facilitate the transition between relief, rehabilitation, and long-term development. We have acted to reduce the provision of food aid-in-kind. These changes have been more than compensated for by increasing financial assistance, which is a more suitable instrument for addressing the root causes of food insecurity. We recognize that food aid can have disruptive effects on local food markets and production and have therefore promoted regional and local purchases of food aid. More than 30 percent of EC food aid is purchased this way, and we expect that figure to continue to increase. The EC has been

at the forefront of international initiatives to improve the management of food aid, such as the EC's Code of Conduct on Food Aid and the London Food Aid Convention.

Against this background, it is a matter of much regret that some major food producers continue to use food aid as a means of disposing surpluses in order to support their domestic farming sectors. The damaging effects of these practices are clearly apparent. They result in a serious misallocation of food aid resources. They depress world prices and make food available at times of surplus, when it is less needed. The abuse of food aid damages development in destination countries by distorting food markets and depressing local food production. To avoid such negative fallout, we would welcome strengthened WTO provisions in this area.

...we must give greater prominence to tackling the inequalities that are the bases of poverty and hunger.

The EU has itself been criticized for using export subsidies on agricultural and food products. We have taken these criticisms on board. But it is important to point out that there are fundamental differences between the EU'S approach and the methods employed by other food producers to promote their exports. The EU's use of export subsidies is transparent, fully reported to WTO, and in compliance with WTO obligations. The EU has acted decisively to reduce these subsidies in line with WTO obligations and the form of the Common Agricultural Policy. In 1998, expenditures on export refunds amounted to just 9.4 percent of the value of agricultural exports, compared with 55 percent in 1992.

The European Community is ready to negotiate further reductions in export subsidies provided that all forms of support to exports of agricultural and food products are treated on a common footing.

A third example of improved policy coherence relates to fisheries. With 1 billion people dependent on fish for their food security, the sustainability of global fisheries is a source of major concern. Most of the fisheries available to developing countries are now fully exploited or overfished, and are subject to competing pressures from local artisanal fishers, industrial fishing based in developing countries, and fishing fleets originating from developed countries. The activities of some companies are best described as modern economic piracy. Again, the EU is going through critical self-assessment. The EU supports the development of the fisheries sector in many developing countries, and focuses on the interests of poor local fishing communities. At the same time the Common Fisheries Policy provides access to EU fishing fleets to developing country fisheries under the terms of the fisheries agreements. The EC has recognized the need to ensure greater coherence between development objectives and the objectives of the Common Fisheries Policy, and has launched a new policy framework that aims to balance these different interests and ensure sustainable fisheries management.

This is an important step forward, but similar actions are required from non-EU nations with large fishing fleets on the high seas. We need to ensure international cooperation for the better global governance of fish stocks. The UN Convention on the Law of the Seas (articles 61 and 62) and the FAO Code of Conduct for Responsible Fisheries are quite clear on the principles to be followed. What we need is universal cooperation on data collection, stock surveillance, and control and enforcement.

Coherent policy is important. So too is the ability to demonstrate tangible action. The EC has a strong capacity to deliver results on the ground in support of food security. Above and beyond the

bilateral efforts of member states, the EC manages a development aid portfolio of roughly 7.5 billion euro annually, making it the world's fifth largest donor. The lion's share of these resources is devoted directly or indirectly to food security as a key objective of EC development cooperation. Roughly 500 million euro is allocated each year to a food security budget-line specifically aimed at addressing situations of structural food insecurity and temporary food shortages, and linking relief, rehabilitation, and development. EC development aid supports a large number of sectors relevant to food security, including agricultural production and research, infrastructure, private sector development, environment and natural resources management, marketing and trade development, regional integration, crisis management, emergency support, and targeted safety net programs.

All of these resources are programmed in a coherent way to support the overall objective of poverty reduction in the framework of country strategy papers elaborated on the basis of consultations with governments and civil society.

So far I have emphasized the role of the international community in fighting hunger. I would now like to shift to the role of national governments, which have the primary responsibility for addressing food insecurity.

Experience has shown that good governance, the rule of law, and, above all, democracy and accountable government are essential to food security. This point has been made well by Amartya Sen, the Nobel Prize winner in economics, who points out that "no famine has ever taken place in the history of the world in a functioning democracy." We have also seen all too frequently how famine and conflict arise together. Without progress in conflict prevention and peace building we will not win the battle in fighting hunger.

In addition, national governments must also put in place sound economic policies and effective institutions that foster broad-based economic growth and poverty reduction. The preparation of poverty reduction strategy papers in many countries is a promising step that indicates genuine government commitment to poverty reduction and policy reform. They provide a new foundation for development cooperation that is based on government ownership of development and donor coordination around nationally identified priorities. This provides a much stronger basis for the effective use of development aid in tackling poverty and hunger.

...food security issues need to be given more explicit attention as a core element of poverty reduction strategies.

The EC supports the development of poverty reduction strategies through policy dialogue and capacity building and provides strong financial support to their implementation. We recognize that important progress has been made, but there is still some way to go to elaborate these strategies and to link them more firmly to poverty reduction. In particular, food security issues need to be given more explicit attention as a core element of poverty reduction strategies. It is also essential to ensure the widespread participation of civil society in the formulation of poverty reduction strategies in order to allow the voices of the poor to be heard.

As we look to the future we must recognize the urgent need to respond to the bewildering number of changes under way, including global warming, land degradation, increasing competition for water, health crises, urbanization, globalization, changes in the organization of agricultural research, and the increasing pace of technological change. Some of these changes present important opportunities but others are major threats to food security. Global warming, in particular, has the potential to totally

transform global agricultural production and to wipe out the gains that have been made in food security and poverty reduction in recent decades. This potential underlines the urgent need for all countries to ratify and implement the Kyoto Protocol. To today's children in Africa, the trends in global warming, desertification, and changing patterns of rainfall, with the potential dramatic decline in agricultural productivity, are not conference topics: they are grim challenges to the chances of survival.

Discussion

As in the previous discussion, the key topics explored in this session included food aid and safety nets. A participant stated that a consensus seemed to be emerging out of the Conference that safety nets are an important part of achieving food security for certain households. A second consensus appeared to be that food aid should be given only in an emergency food shortage situation, but not permanently. According to Poul Nielson's presentation, the EC's safety net schemes seem to be working with food aid, with the physical distribution of food. However, this participant asked, is this the most effective and beneficial way of putting up safety nets, compared with cash-oriented safety nets? Nielson replied that no one solution always works best. In a postconflict situation with disorganization and nonfunctional infrastructure, food in kind is more meaningful. However, in cases with more flexibility and with local markets in place, it is preferable to use money. The situation defines what is most useful, but the trend is clear—there is a need to push for more cash support. It is also important to take more seriously the long-term food security approach instead of the food aid approach.

The same participant asked whether, if the right to food was taken as a human right that must be fulfilled like a civil right, it would allow more financing for what is needed to achieve food security, including safety nets. Nielson stated that although the idea of food as a human right may add to public awareness about hunger, it may be more beneficial to closely link food security with poverty in order to maximize pressure for undertaking antipoverty efforts. In practical terms, the totality of the poverty perspective means that efforts to reduce poverty receive more attention in terms of demands on politics, distribution, and access to resources.

Another comment from the audience pointed out that food aid can involve more than just dumping surpluses and that, as in the case of the EC, food aid is also purchased from several producers worldwide. This can be a useful tool. When the participant expressed concern about the possible decline in the EC budget for food aid in kind and for food security activities that are more production oriented, Nielson responded that the budget trend is downward and reflects a stronger focus on poverty in the general policy. The overall priorities are better, however, and although the specific budget line is reduced, the amount is still sufficient to do

what needs to be done. The EC is anchoring the effort more directly in its partner organizations.

Nielson referred to the previous discussion on the Everything but Arms initiative, explaining that global pressure for this kind of change was welcome. He noted that the coming enlargement of the EU calls Europe's bluff on the sustainability of what it is doing and means that the Common Agricultural Policy cannot, and will not, be continued. Taken together, the global pressure and the opening up of markets for the 78 members of the ACP group, along with the clear decision that fundamental changes are needed in agricultural policy in Europe, will push things in the right direction. Nielson concluded that if the new negotiations in WTO produce what we hope for and work for, there is some reason for optimism.

Finally, when asked by a participant if more coordination is needed to make development assistance from both the EC and its member states more effective, Nielson pointed out that the division of labor is clearly organized via treaties. The role of the EC is to complement the efforts of member states. There is no need for the EC and its member states to look like one donor, but rather to coordinate with each other. Member states can concentrate their bilateral development cooperation in a small number of countries of their choice, whereas the EC works globally.

C. TECHNOLOGICAL AND ENVIRONMENTAL FORCES

Chapter 14

The Future of Agriculture in Sub-Saharan Africa and South Asia: W(h)ither the Small Farm?

Chair: Peter Hazell
Director of the Environment and Production Technology Division, International Food Policy Research Institute

If we want pro-poor development, then we have to give high priority to small farmers, in other words, to broad-based agricultural development. Small farmers are the keystone of a pro-poor development strategy, but this statement is not without its critics.

Many developing country policymakers have looked at the large commercial farmers in the rich countries. They've seen large, commercial, high-tech, mechanized efficiency, and they've said they want some of that, too. There have been many attempts to transfer the Western model to developing countries, most of which have proved to be costly financial failures. We now know that it isn't simply a matter of making a choice. Going from small to large farms is part of the dynamics of development.

Agrarian countries, where most of the workers are in agriculture, have cheap farm labor and expensive capital. Small farming is economically efficient under those conditions. As countries grow and diversify and workers leave agriculture, wages go up in agriculture, capital becomes cheaper, and it becomes economical to have larger farms. There is a natural economic transition.

Getting from small to large means going through the dynamics of the development process. You can no more skip that transition than you can go from being a child to being an adult without going through the difficult process of growing up.

This is an old debate, and most of us still cherish the paradigm that the small farm is the way forward. But there are new challenges for the small farm that perhaps again threaten the paradigm. Let me mention two. One is that, with continuing population growth and a fixed land base, small farms are getting smaller. We worry now about the miniaturization problem, that small farms are perhaps too small to be efficient. They certainly seem to be too small to provide an adequate livelihood for the families that they support.

The other challenge is that, with a glut in world agricultural markets and with trade liberalization, the small farmer has been asked to compete against cheap imports, many of them unfairly subsidized. At the same time, world market prices for traditional agricultural exports, like coffee and tea, are at historic lows.

So where are the market opportunities for small farms in the future? Small farms have some possibility of feeding themselves, and perhaps their neighbors, better. But how are they going to rise beyond subsistence to increase their incomes to become richer in this modern, globalized world?

These are difficult questions, and extremely pertinent ones for Africa and South Asia, which are still dominated by small family farms.

Sub-Saharan Africa:

Dunstan Spencer
Managing Director of Dunstan Spencer and Associates, Sierra Leone

In most of Sub-Saharan Africa, over 96 percent of farmers operate on a small scale, farming less than five hectares. In fact, over two-thirds of them farm

less than one hectare. Small-scale farms account for over 90 percent of agricultural production. Even in the mid- and high-altitude savanna woodlands of Kenya, Zambia, and Zimbabwe, where the very visible "white" farmers are located, large-scale maize farms (80 hectares or more) yielding 5–6 tons per hectare account for less than half of total maize production, and 99 percent of farmers are small scale, producing much lower yields (1.5 tons per hectare).

Small farmers in Sub-Saharan Africa are efficient, usually making good use of their resources, and are certainly more efficient than many large farmers. However, the vast majority are very poor. United Nations statistics indicate that over two-thirds of the rural population in most Sub-Saharan Africa countries live in absolute poverty, subsisting on less than $1 per day. What is worse, in many cases their situation has worsened over the last three decades. Sub-Saharan Africa is the only region where the annual growth of gross domestic product per capita has been negative, at –1.0 percent between 1975 and 1999, compared with 6.0 percent for East Asia and the Pacific and 2.3 percent for South Asia. And if that is not bad enough, the region is currently inflicted by major health problems, with 8.7 percent of the adult population estimated as living with HIV/AIDS, compared with a world average of 1.1 percent. Almost 13 million of the 16 million adult women living with HIV/AIDS are found in Africa, the vast majority in the rural areas. In 1998 tuberculosis cases in Africa were recorded at 121 persons per thousand compared with a world average of 63.

The agriculture of the vast majority of these small-scale, food-insecure rural households is characterized by family economies with weak linkages to markets and little or no access to external inputs. Small-scale farmers usually farm degraded lands with complex and diverse farming systems. Furthermore, most small-scale farmers are far from services and roads, and consequently from extension programs.

Small farmers in Sub-Saharan Africa are efficient, usually making good use of their resources.

In addition to this, small farmers in Sub-Saharan Africa are faced with a number of new challenges. First, they confront a decline in the worldwide relative prices for traditional export commodities such as cocoa, cotton, oil palm, and tea. This is compounded by the increasing costs of inputs at the farm level due to structural adjustment programs that have removed subsidies and increased supply costs due to the deterioration of state-maintained rural infrastructure. All of these changes have led to reductions in profit margins. Second, small farmers face increasing competition from globalization as a result of the Agreement on Agriculture of the WTO. In theory this agreement should give small farmers, like all others, access to lucrative world markets, but in fact it is likely to spell death for many small farmers, who will lose much of their own urban market to imported goods from other continents. Unless concerted steps are taken, small farmers in Sub-Saharan Africa are doomed to a life of poverty, isolation, and disease in remote areas, while the able-bodied members of their families move initially to the city slums of their own countries to provide cheap labor, as a stepping stone to becoming the next generation of "boat people" heading for the "promised lands" of the West and East.

The agriculture of Sub-Saharan Africa—small-farm agriculture—is currently showing little sign of being able to compete in the liberalized global economy. Global market share is constantly being eroded. To correct the situation and prevent the vast majority of farmers from becoming unskilled laborers in the world economy, a strong coalition of national governments, the private sector, nongovernmental organizations, and the international donor community is necessary. This coalition must continue the ongoing moves toward "good governance" and democratic processes that empower rural people so that their needs are given adequate attention in national policymaking. This is the bright spot in development over the last decade and must continue.

The coalition should take steps to make HIV/AIDS drugs freely and cheaply available and to control tuberculosis, malaria, and other killer diseases so as to prevent a further decline in small-farm labor productivity. Western countries must convince their multinational pharmaceutical companies to drastically reduce prices.

The coalition should provide national governments with the means to invest in people-centered development—that is, education, health, and rural infrastructure like roads, irrigation systems, markets, and postharvest machinery. We must not only reverse the declining trends, but increase investment severalfold. Critical in this respect is debt relief. The donor community must put its money where its mouth is—less rhetoric and more action on the ground.

We need to reverse the disgraceful downward trend in support to government research and extension systems, in order to generate more appropriate, sustainable technologies and make them available to small farmers. And we must provide small farmers with reduced farm gate costs and increased access to fertilizers and credit. These two inputs are critical for adoption of more modern production practices, including environmentally friendly and sustainable technologies that build on the strengths of traditional agricultural systems by maximizing the use of biological recycling.

With such concerted actions, among others, there is hope that small farmers in Sub-Saharan Africa can participate in the global economy, either by retaining their comparative advantage in traditional commodities or by diversifying into the "newer" commodities such as cut flowers, high-value vegetables, and livestock products, in which they face stiff competition from other world producers.

The agriculture of Sub-Saharan Africa—small-farm agriculture—is currently showing little sign of being able to compete in the liberalized global economy.

South Asia:
Ashok Gulati

Director of the Markets and Structural Studies Division, International Food Policy Research Institute

What is South Asia? South Asia is living on 2 percent of the world's income but with 22 percent of the population, and 44 percent of its people live on less than a dollar a day. That is easy to remember: 2, 22, 44.

This is a place where 125 million farm holdings are operating on 200 million hectares, with an average size of 1.6 hectares. That 1.6 hectares is reasonably big enough when compared to an average area of only 0.6 hectares farmed by 80 percent of the holdings. That is about as small as a football field in Europe.

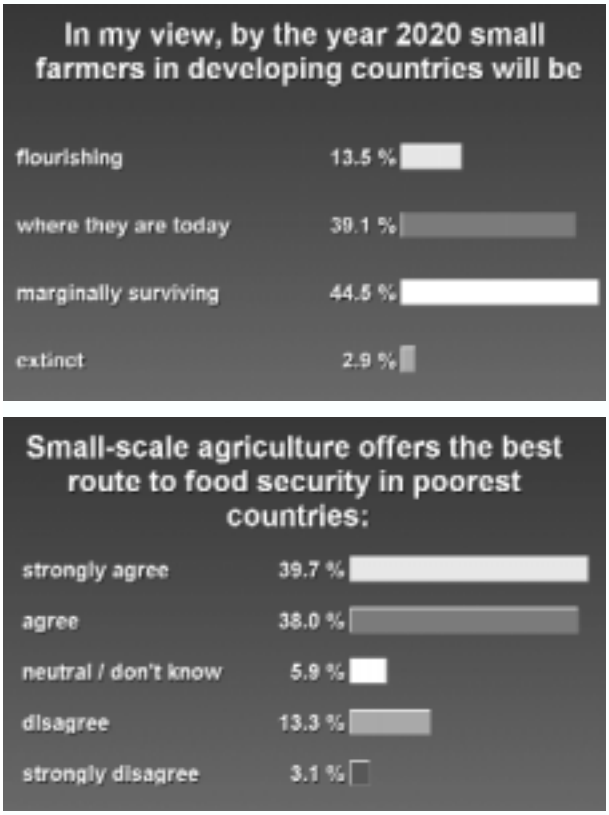
And if that is not sufficiently disturbing, in one country, Bangladesh, 96 percent of the holdings have an average size of just 0.3 hectare. Average arable landholding in Bangladesh is 0.06 hectare. These farmers latch on to that small plot of land, knowing that it is the last hope for their food security.

The biggest country in the region, India, accounts for about 81 percent of the economy of the region and has the largest number of smallholdings. Pakistan has much larger holdings, but Bangladesh neutralizes that.

The productivity on these farmlands is much lower than average global productivity. On this small patch of land, off-farm employment is extremely critical. At present, about 25 percent of smallholder incomes come from off-farm activities.

The question is, 20 years from now, will smallholders exist or not? Given population growth, globalization, and economic growth, that question perhaps also offers an opportunity. For the last 20 years, South Asia has been the second-fastest growing region in the world. It registered a 5-percent-plus

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

rate of growth from 1980 to 2000 and is expected to grow almost at the same rate or even higher from 2000 to 2020. What hope does that offer? It offers plenty of hope, if we play our policies right.

Population growth stands at about 2 percent per year in the region, but for some countries it is slowing. If India drops further—it is 1.7 percent now, and likely to drop to 1.5 percent—the demographic gift will come into play. That is, the dependency ratio will fall and the labor force will increase, making the productive heartbeat more robust.

But arable land has stopped expanding, and if the population keeps on growing, even at 1.6 or 1.7 percent a year, what will happen to the small farm? Will Indian smallholders be left with plots smaller than the current average of 0.6 hectare? Will they go, like Bangladesh, to 0.3 or 0.2 hectare?

In India, "reverse tenancy" is emerging. In reverse tenancy the really marginal farmers, who are keeping one foot in agriculture, find it beneficial to move out as the off-farm economy expands. When they move out, they do not sell off their land immediately, but lease it to those who are in the middle rungs. So the middle peasantry leases from very small landholders, as well as from the big ones. Perhaps this is part of the dynamic process the chairman spoke of, and as such, it should give us hope. How big will the big farm end up being? It is unlikely to exceed 2 hectares and at maximum 4 hectares. Two to four hectares will be the productive heartbeat of this region.

What can policymakers do to facilitate the reverse tenancy process? At present, the laws in most Indian states do not permit tenancy of that type. Reverse tenancy is taking place without solid legal backing. Those who lease out land are at risk of losing ownership of that land. And those who lease land have little incentive to invest in it without proper ownership. Land reforms of the 1950s and 1960s half failed and half succeeded. At that time the pressure was to cap the ceiling on land size and redistribute the "surplus" land. But now, the main concern, except in Pakistan, is that the size of holding may be too small to be economically viable. Countries in the region other than Pakistan need to consolidate land and free up the land market so that economically viable farms, 2 to 4 hectares in size, can emerge.

One thing would facilitate that process. Those who want to remain in agriculture and own farms within this emerging land-size category need credit. For that we may require substantial innovations in the credit markets.

In addition to farmland size, water scarcity will present another major challenge in the region. In fact, the real threat to food security will come from water scarcity, putting small farmers at a particular disadvantage. In the last 15 years, public investments in canal irrigation have decreased dramatically, thanks to the Asian Development Bank (ADB) and other funding agencies pulling back from loans for major and medium irrigation schemes. Maybe because the

real prices of cereal came down, governments did not find it worthwhile to invest in canal irrigation. But private investments in irrigation, especially using groundwater, continued unabated. The groundwater table in the most prosperous Indian states of Punjab and Haryana is decreasing by 1 to $1^1/_2$ feet per year.

An even bigger concern related to water is that the larger farmer will be able to dig deeper and deeper, encroaching on the water rights of smaller farmers in adjoining areas, so their wells dry up. That becomes a frighteningly real prospect because practically no laws can be implemented in a manner that protects rights to water. Water pricing and water institutions also need reform.

...the real threat to food security will come from water scarcity, putting small farmers at a particular disadvantage.

Will this region be able to feed itself with these small farms and growing water scarcity? Let me take you back to the 1960s when the region was considered a basket case. There was a book written by William and Paul Paddock, *Famine 1975*. They said that no one could save this region, that the Indian and Bengal famine—in which "only" 3 million people died—would be put to shame. By 1975, they said, famine would claim more than 6, 7, even 8 million lives.

The region was living from ship to mouth. What came to our rescue? It was that miracle seed, thanks to Norman Borlaug and the group of people at the International Maize and Wheat Improvement Center (CIMMYT). Because we lived through that period, we know the political compulsions behind food aid, we learned lessons, and we never want to return to a dependence on aid. Therefore, whatever the cost, South Asia would like to stand on its own legs. We have the responsibility of feeding 1.3 billion people.

Research and development (R&D) was, and still is, critical. And that is our problem: at present, our region is investing only 0.5 percent of its agriculture GDP in R&D. It should be at least 1 percent. That amount needs to be corrected.

The next challenge is globalization. Will South Asia survive the globalization wave? I ask for only one thing: Give us the gift of what we call the rice pudding in negotiations. This region lives on rice, milk, and sugar. Mix the three and you get rice pudding. But these three commodities have the most distorted prices in the world market.

Look at the price of rice in Bangladesh and in Japan. The difference between the two is a question of market access. Look at the huge subsidization of milk in Europe. Who is the largest milk producer? It's India. With its small farms, India is the largest milk producer, with one or two milch animals. And look at sugar. The export subsidy in the EU on sugar is $470 a ton, and the price in South Asia is $220 a ton. How can we compete? A level playing field is required.

As I said earlier, rapid economic growth gives South Asia hope. When economic growth takes place, it's accompanied by demand for high-value commodities. The demand for fish, poultry, dairy, fruits and vegetables, and horticultural products is rising three times faster than the demand for staples. These high-value crops are the last hope for small farmers. But to produce these commodities, they need credit. Innovations in microcredit have taken place in Bangladesh, but the concerns of those operating 1 hectare to 2 hectares of land have not been addressed. Microcredit schemes for small and marginal farmers are needed. India has started something called Kisan Credit Cards. Ten to 15 million credit cards have been given to small farmers. These are the kind of innovations that are required to get small farmers off the ground.

My last point concerns integration of small farmers with business. Businesses put up the

necessary money. Unless we integrate the farm with the firm, we won't get the production and the processing of high-value crops.

Finally, I would advocate a major experiment in the region involving farmer cooperatives. Verghese Kurien, who got the World Food Prize in 1989, was responsible for ushering in a white revolution in India. He organized milk producers in farmer cooperatives. Each producer in the cooperative could bring even small quantities of surplus milk to the processing plant. Dr. Kurien thus combined farm and processing facility through a cooperative network that millions of farmers belonged to. These smallholders have benefited greatly from the cooperatives.

I think small and marginal farmers can survive and prosper for the next 20 years, if opportunities accompany hope.

Discussion

The discussion began with a participant pointing out that the issue of organizing small farmers was missing from the presentations. Credit facilities will have difficulty servicing small farmers, the participant said, unless the farmers are able to aggregate their demand to buy inputs at discount prices and aggregate their produce to argue for higher prices. Ashok Gulati responded that the key question is what organizational structure will allow small farmers to survive and perhaps flourish. Required institutional reforms involve either consolidating the landholdings or cutting the transaction costs of the smallholdings. Gulati argued that smallholdings are not inefficient in terms of productivity per hectare or cost per unit of output; they can compete in global markets provided the playing field is level. Where small farmers have a disadvantage is in the transaction cost of collecting small surpluses and getting them to the market of the processors. In some cases, however, smallholders have organized with the processors and achieved high-value production. Dunstan Spencer agreed that we should be helping farmers get to a stage where they can organize themselves better. Farm cooperatives are necessary but not sufficient, for small-farmer organizations will not be enough to redress the balance adequately in favor of small farms. In his closing, the Chair, Peter Hazell, reiterated that based on research at IFPRI, small farms are still efficient producers but are becoming increasingly disadvantaged in the marketplace, both in acquiring inputs and in selling products. The future belongs to those who are organized. There are successful examples where small farmers have organized to sell high-value products and to obtain cheaper inputs, but the negative experience with public cooperatives should also be remembered. Hazell argued that finding the most successful formula for organization is one of the greatest challenges.

Another hot topic of debate was the consolidation of small farms. A participant questioned whether efforts to encourage consolidation of small farms will contribute to the reduction of poverty. Because small farms tend to use labor and large farms tend to use capital, there was concern about the potential for enormous loss in agricultural employment

income. In reaction, another participant contended that concern was unwarranted as long as changes in the size of holdings are compensated for by opportunities within the environment where consolidation is taking place. For example, if farms are getting larger and production is more efficient but at the same time agricultural development produces linkages to industrialization, opportunities for employment will arise. The participant noted that development in an integrated fashion will help solve the concerns. Gulati added that if legal obstacles are overcome, the speed at which consolidation takes place through market forces will be the speed at which all farm activity develops, because workers will not leave the land until they are sure that off-farm activity will offer them enough income. The survival of off-farm activity depends, however, on the productivity of agriculture.

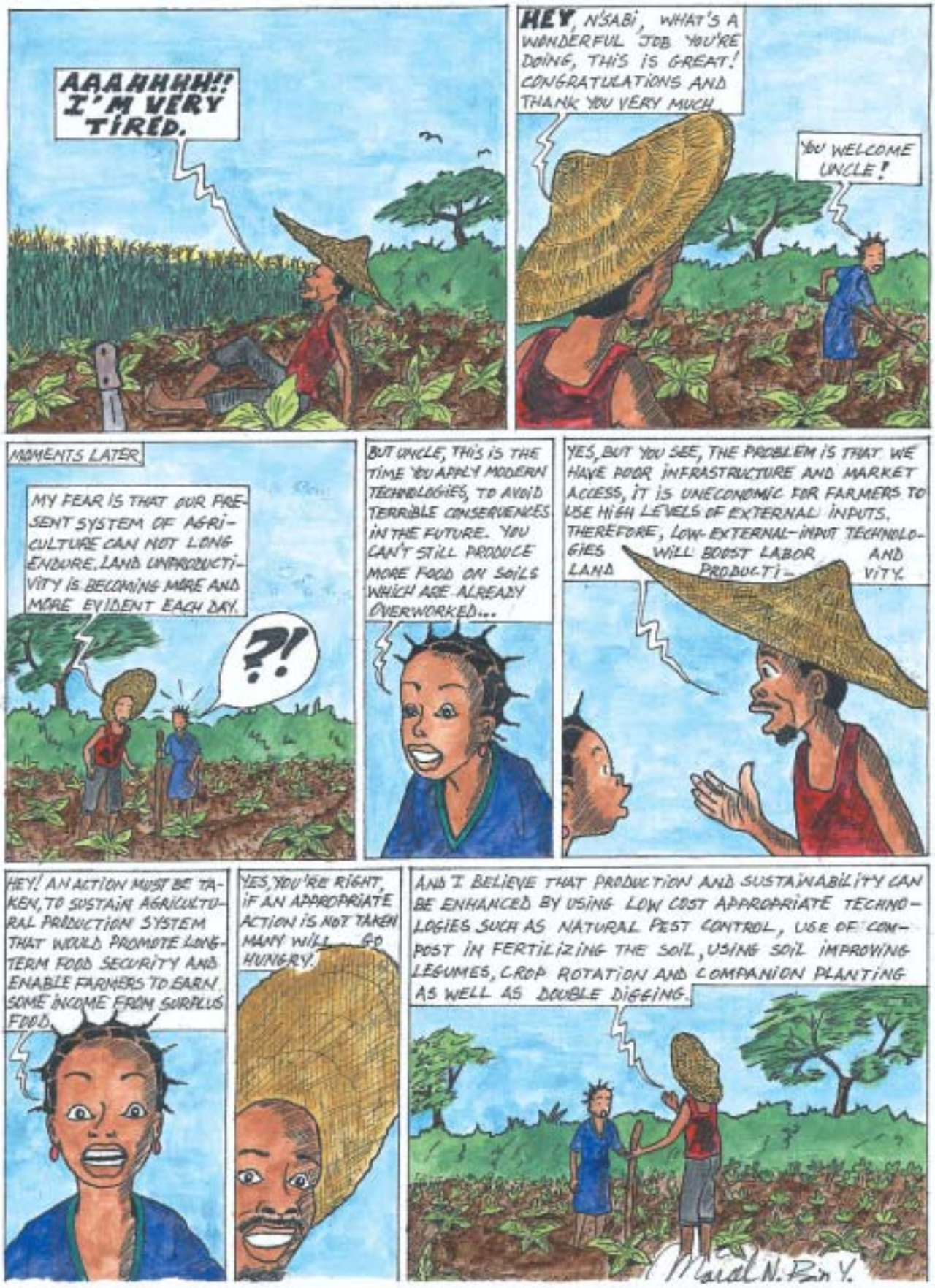
South Africa was pointed to as an atypical case because of its dichotomy of small and large farms. A participant, the Minister of Agriculture and Land Affairs in South Africa, used that country as an example of a continuum of small, medium, and large farmers where there is no either/or policy option. The challenge is to clarify the roles that governments, the private sector, and farmers play in investment in agricultural research, human resource development, and extension services. The participant added that governments in Sub-Saharan Africa know what they need and want to do but don't have the resources to do it. Since they do not have enough capital, they depend on loans that impose particular conditionalities and policy directions, impeding independent choices. Given the South African experience, the task is to help commercial-sector or large-scale farmers gain access to markets in the North, where subsidies create a playing field that is still far from level.

Participants made short comments on a variety of other issues. For one, a participant pointed out that although a country may have national food security, food security may not exist at the household level, especially among rural people in high-density areas. In response to a question on why we need to protect small farms from transforming, Spencer said that we have already set the stage for small farmers to disappear and that we must ensure that the situation is improved for the few that remain. Other comments and questions touched on issues such as the effects of ecological changes on food security, especially in the southern part of Africa; South Asia's lack of comparative advantage in oilseeds; food aid and continuous conflicts within Africa; and the fact that if a nation's currency is declining, its ability to purchase food on the global market is affected.

During the panelists' closing presentations, Gulati pointed to the lack of discussion about credit, stating that 45 percent of the credit obtained by small and marginal farmers comes from informal sources with interest rates ranging from 24 to 48 percent per year. A major intervention by the state is required. Spencer mentioned that if the international economy operated with a free flow of labor, workers would move to places where labor is needed as opposed to living in urban slums. They would provide services where labor is needed and send remittances to their home communities. This would help create a level playing field.

In closing the session, the Chair stressed that if agricultural growth is truly going to reduce rural poverty, then sorting out the small-farm strategy problem is probably one of the most fundamental tasks. If small farmers are to sustain their livelihoods until economies can grow and provide alternatives, then governments and donors must adopt smart policies and smart investments targeted to the needs of small farmers. This scenario is possible, but is it likely? Current trends are moving in the opposite direction. Research and development for small farms is declining. Credit for small farms has virtually disappeared with credit market liberalization. Microfinance exists for the very poor and commercial credit for the large farmers, but in between is a total vacuum. The Chair noted that many policy changes are needed before one can be optimistic about the future of the millions of small farmers in the developing world.

MODERN TECHNOLOGIES BYPASSING THE POOR



The illustrations and text featured here are by Marcel Niyungi Bin Yungi, an artist born in Zaire and now living in Kenya. The 2020 Vision Initiative commissioned him to create comic strips depicting his perspective on key food security issues.

Chapter 15

Turning Up the Heat: How Will Agriculture Weather Global Climate Change?

Chair: Pedro Sanchez
Director General, International Centre for Research in Agroforestry*

There is a nexus between climate change, food security, soil fertility, and other agricultural practices. I say this first to emphasize that climate change is a development issue. There is no question about this. The evidence of global warming at this point is scientifically unequivocal, and we are facing some major problems. It is predicted that Africa will be the most vulnerable region. We must work both on adaptation and mitigation aspects.

At the Future Harvest centers of the Consultative Group on International Agricultural Research (CGIAR), we have been working to identify some of the key issues. We have also taken a backward look at what the advances in food production during the last 30 years have done for climate change, and we have found that the advantages are enormous. Basically the Green Revolution and associated technologies promoted by the CGIAR and its partners in totality have delayed the carbon dioxide (CO_2) build-up in the atmosphere by five years. If that had not happened, we would be at 2006 CO_2 levels. That delay is a nice thing, but the future is terrifying.

Very recently we have also found increasing grain sterility in all the major cereal crops resulting from what we call thermal stress, additional maximum temperatures. IRRI has found that for every degree centigrade increase in maximum temperature, there will be a 16 percent decrease in grain yield due to grain sterility. If you put these predictions in line with the Intergovernmental Panel on Climate Change (IPCC) predictions, this translates to a decrease in world food production of 5 to 11 percent by 2020 and 11 to 46 percent by 2050. When the European Commissioner for Development says global warming can wipe out the gains we have made in food security, he is absolutely right. The way to counteract this is obviously through agricultural research.

Now, I want to go into the nexus between hunger and soil fertility, and this is specific to Africa. Soil fertility is clearly identified as the biophysical root cause for hunger in Africa. It is a biophysical imperative—you have to attack it. And it is also a logical entry point for development.

A traditional way of handling soil fertility is through fertilizers. But fertilizers cost two to six times more in Africa than anywhere else in the world at the farm gate, a gross policy distortion. So for very small farmers, usually with less than two hectares, an alternative has been developed that combines nitrogen fixing trees and locally available rock phosphates. It doubles, sometimes triples, maize yields. This has resulted in food security for about 50,000 farm families throughout Eastern and Southern Africa.

In addition to having that food security, many of the younger farmers are shifting to high-value crops, just as our speaker from India said. And for some of them, their incomes are going from less than $1 a day, to about $10 a day by diversifying from maize to high-value products.

* Summary note included in Appendix 3.

Now, it's very nice to have 50,000 farmers achieving food security, but that's a drop in the bucket. This success must be scaled up to 50 million farmers by the year 2010. And that is a challenge for development. We estimate that this challenge will cost about $100 million a year, which is peanuts.

What does this have to do with climate change? When farmers shift from fertility-depleted unproductive croplands to agroforestry systems, the soils and the trees sequester 5 to 10 times more carbon per hectare per year than most other farming systems in the world. Farming communities should benefit from this global environmental benefit in the Kyoto Protocol. If they did, that would also help us not only reinsure their food security but alleviate poverty.

...the Green Revolution and associated technologies promoted by the CGIAR and its partners in totality have delayed the carbon dioxide (CO_2) build-up in the atmosphere by five years.

Keynote: Martin L. Parry

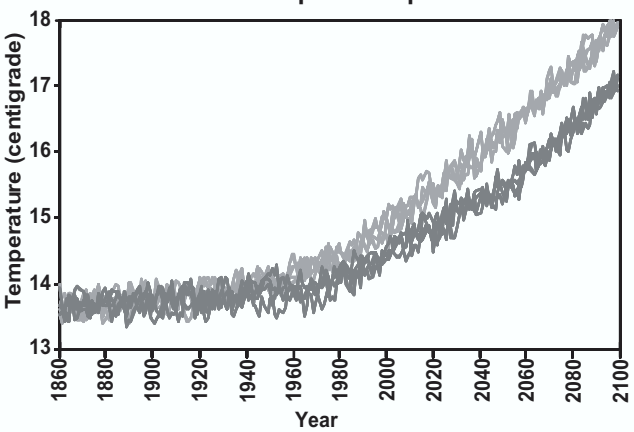
Director, Jackson Environment Institute,
University of East Anglia

Exactly 20 years ago I started to work on climate change at the International Institute of Applied Systems Analysis (IIASA) and the United Nations Environment Programme (UNEP) and developed a series of case studies on climate change and its impacts on food security. One of our studies was in India, based at ICRISAT. But the scientists there, led by the head of farming systems at the time, worked in their boss's kitchen, not in his office. They did so because he was forbidden by Leslie Swindale, the distinguished director of ICRISAT—and I use the word "distinguished" sincerely—to undertake that work as part of his formal duties. Swindale argued—quite reasonably, I think—that climate change was not an issue that confronted agriculture then, and was not as important as "here and now" issues such as drought and weather.

What has changed since then is that we know much more about climate change. The conclusion of this year's IPCC report is that climate change may be occurring now, in other words, that droughts and other weather events occurring now may be altered in their frequency and tendency and intensity as a result of climate change. The variability of weather that Swindale argued was the priority 20 years ago has become part of the climate change research agenda of today.

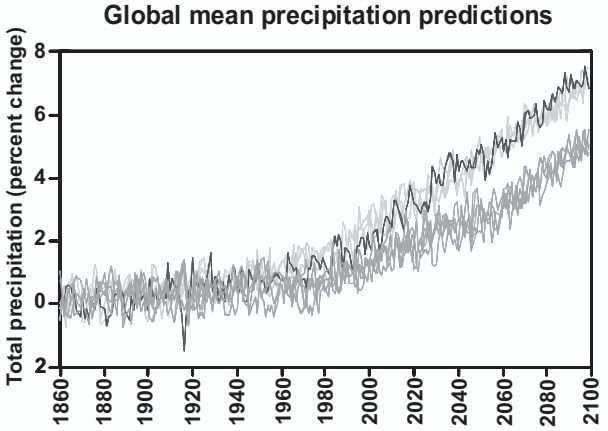
Today, we have begun to think of climate change as a development issue, and specifically as a challenge to sustainable development. My resulting conclusion has two parts:

- Climate change will hit the marginalized and most vulnerable people most.
- Mitigation will not solve the problem. Even 10 times the current Kyoto emissions reductions will not avoid significant impacts. As a consequence, we need both adaptation and mitigation as part of the sustainable development pathway to confront this issue.



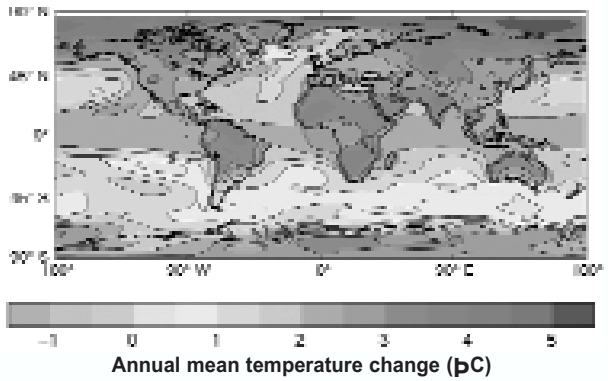
Source: Hadley Centre for Climate Prediction and Research, Met Office, U.K.
Note: Ensembles of four predictions of global mean temperature resulting from "business as usual" changes in greenhouse gases following on from observed changes since 1860. The addition of sulphate aerosol cooling is also shown.

FIGURE 1



Source: Hadley Centre for Climate Prediction and Research, Met Office, U.K.
Note: Ensembles of four predictions of precipitation (rainfall and snowfall) resulting from "business as usual" changes in greenhouse gases following on from observed changes since 1860. The addition of sulphate aerosol cooling is also shown.

FIGURE 2



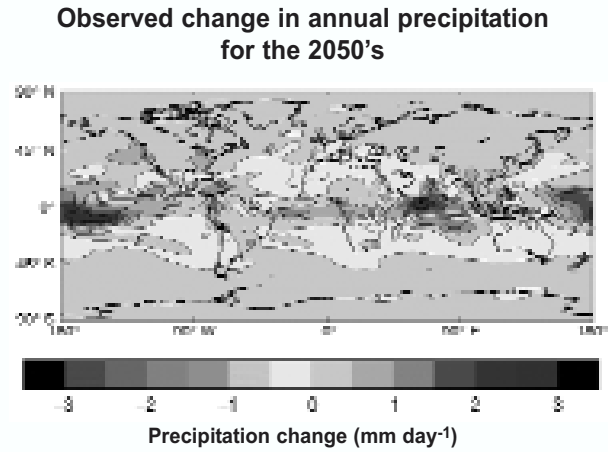
Source: Hadley Centre for Climate Prediction and Research, Met Office, U.K.
Note: The change in annual temperatures for the 2050's compared with the present day, when the climate model is driven with an increase in greenhouse gas concentrations equivalent to about a 1 percent increase per year in CO_2. The map shows the average of four model runs with different starting conditions.

FIGURE 3

Many of you have probably seen the graph in Figure 1. It shows the increase in temperature over the next 100 years or so of between 1.4 and 5.5 degrees.

A warmer world will likely be a wetter world, and Figure 2 indicates the likely increases in global precipitation depending on increases in global temperature.

Climate change will hit the marginalized and most vulnerable people most.



Source: Hadley Centre for Climate Prediction and Research, Met Office, U.K.
Note: The change in annual precipitation for the 2050's compared with the present day, when the climate model is driven with an increase in greenhouse gas concentrations equivalent to about a 1 percent increase per year in CO_2. The map shows the average of four model runs with different starting conditions.

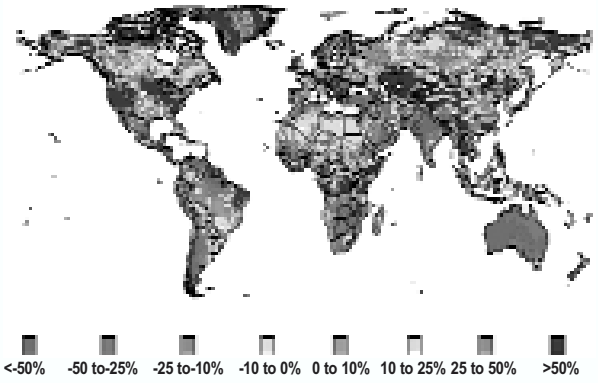
FIGURE 4

We believe that the interiors of the major continents will warm quicker than the oceans (see Figure 3). Thus some of the interior areas that are characterized by the poverty and hunger and food insecurity we are concerned with may experience greater warming than other, less marginal parts of the world.

Figure 4 is probably the most important: it shows the likely changes in precipitation. There are about 10 quality-controlled global computer models used by IPCC. This is based on one of them, but the other nine models broadly give the same picture. The areas of predicted lower rainfall are in semiarid Africa, semiarid South Asia, the Middle East, Central America, the southern United States, and parts of Latin America. Generally speaking, the already moist areas of the world will get wetter (for example, the South Asian monsoon will intensify), and semiarid areas will tend to get drier, due to a combination of increased evapotranspiration and reduced rainfall.

So the changes brought about by climate change are precisely not those that we would wish for. They are probably going to increase the geographical differences between current wet and dry regions of the world.

Annual runoff: A measure of water supply by the 2080s



Percentage change in 30-year average annual runoff by the 2080s.

Source: Prof. Nigel Arnell, University of Southampton.

FIGURE 5

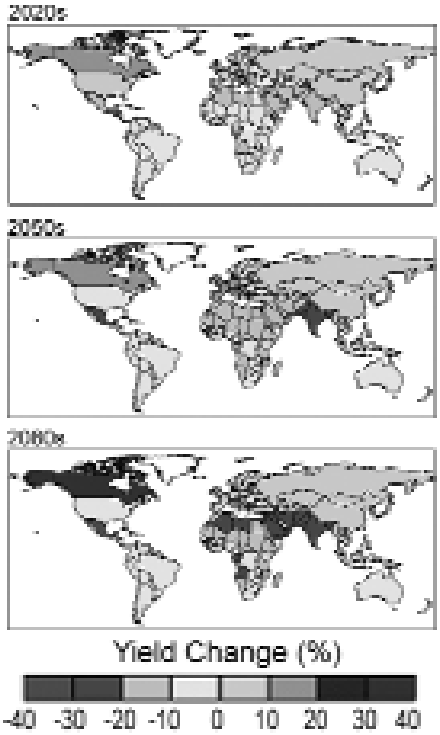
Furthermore, there is evidence that climate is already changing. A host of agroecological and bioclimatic indicators tend to suggest this.

We can take the precipitation graph (Figure 2) and translate it into one of runoff, that is, available moisture for agriculture, whether through dry farming or irrigation (see Figure 5). Once again, the map shows, broadly speaking, that semiarid Africa, Europe, South Asia, and Australasia will likely become more arid. The pattern is mixed in South America.

Now let us consider those patterns of temperature and rainfall taking 10 years. With about 150 scientists using crop growth models of the kind that some of you are quite familiar with, making allowances for irrigation, fertilizer, row spacing, plant type, plant genetics, and so on, let us make a best judgment about the likely effect on agriculture. The conclusions are summarized in Figure 6 as estimated changes in crop yield as a result of climate change. As time progresses and climate warms, yields decrease, particularly in Africa and South Asia.

We may now take these yield changes and put them into the best food models available to ask questions about their effect on food supply. How much do the changes affect our ability to meet anticipated growth of demand? And how much do they affect those possibly at risk of hunger (that is,

Crop yield change: 2020s, 2050s, and 2080s



Sources: Jackson Environment Institute, Goddard Institute for Space Studies, and the International Institute for Applied Systems Analysis.
Notes: The maps show percentage change in average crop yields for the climate change scenario (Hadley Centre model). Effects of CO_2 are taken into account. Crops modeled are wheat, maize, and rice. Changes shown are averaged for national or regional levels based on the economic components of the Basic Linked System, which consists of linked national agricultural sector models.

FIGURE 6

those having insufficient income to buy or ability to grow enough food)? In Figure 7, the reference scenario shows that global production of the world's staple foods (now approximating 2.3 billion metric tons a year) will increase to about 4 billion metric tons annually by the 2080s. The shortfall between demand and supply that is caused by climate change is about 400 to 600 million metric tons by the 2080s, and the shortfall increases over time.

Making assumptions about income and demand for food, these food models allow us to estimate the effect of that expected climate-change-driven shortfall on cereal prices. Based on the increase in cereal prices, the additional number of people at risk of hunger in the 2080s, using an

FAO measure, is estimated to be 50 million, that is, a 10 percent increase due to climate change.

When we started this work in the 1990s, our estimate of people at risk of hunger then was about 500 million. Now we talk about 800 million. The numbers don't matter so much, because they depend on the definition, but it's the change in the value that I'm interested in. Because of climate change, we've got something like a 10 percent increase in the number at risk of hunger.

That's a global figure. What happens if we look at Africa? Figure 8 shows that almost three-quarters of the additional millions at risk of hunger resulting from climate change are in Africa. Again, this occurs for reasons depicted in the earlier figures on precipitation changes and location of increasing aridity.

Five or six modeling groups are working in this area, probably less than 200 or 300 scientists, from agrometeorologists to food trade modelers and climatologists. These groups have begun to conclude that climate change will have an overall negative effect on yield, with some marked reductions in particular areas, leading to likely increases in the risk of hunger. This effect is on top of any effects that a nonclimate audience would think of.

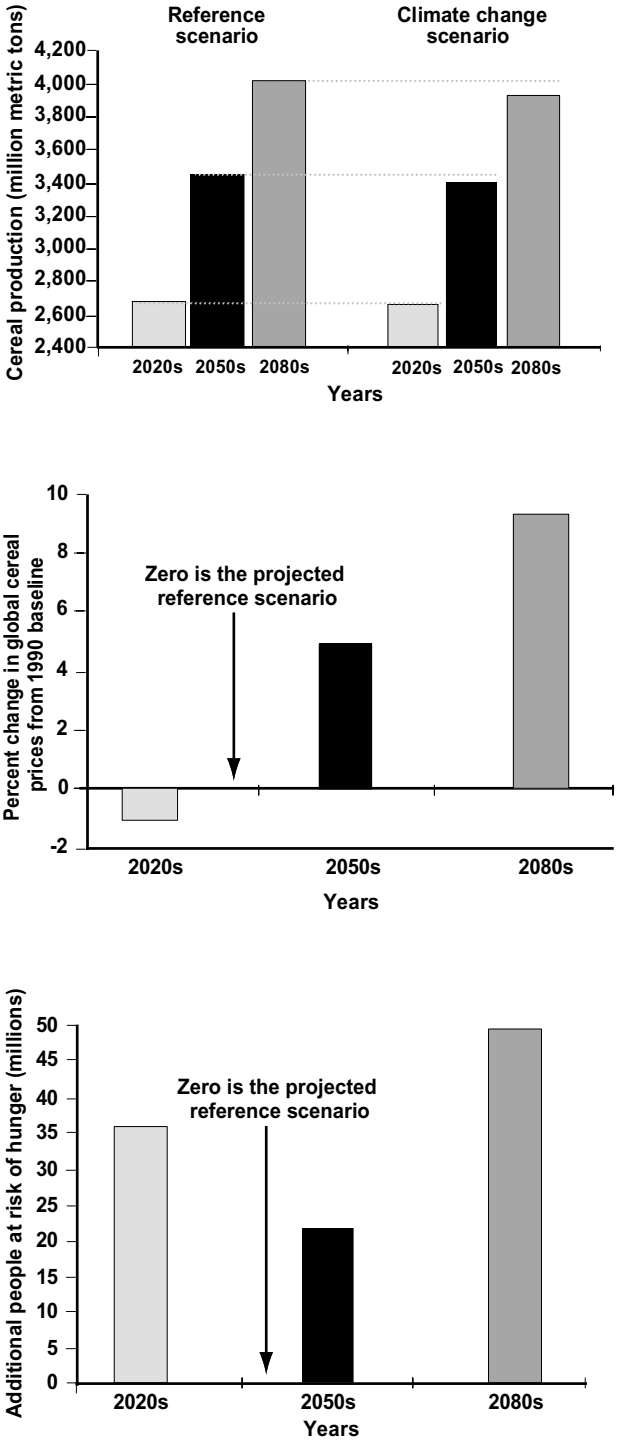
I haven't talked at all about the altered weather effect in particular times and places in the short term. One may get quite specific adverse effects on farmers resulting from floods, droughts, and cyclones. But here I am focusing on the trend through to 2080.

One solution might be to mitigate climate change until it's out of the system, and that, in a sense, is what about 90 percent of the negotiating effort on climate change is currently promoting. Figure 9 gives a couple of examples of substantial mitigation efforts: 10 and 20 times the Kyoto effort to bring down carbon emissions.

Unfortunately, the effect that climate change mitigation has on estimates of people at risk of hunger is not much. If you look at 2080

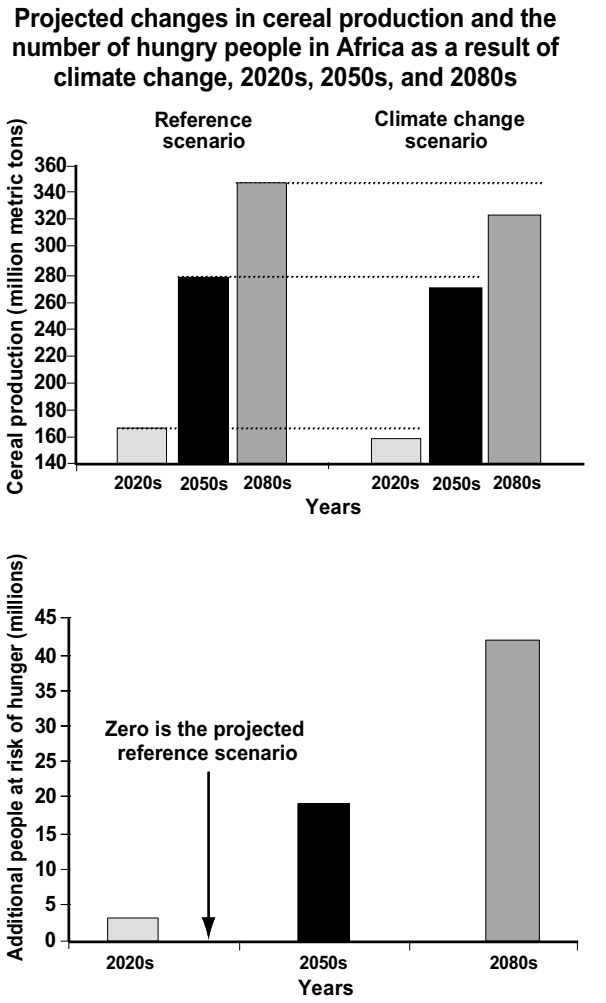
...we need to look at a future where adaptation and mitigation in the context of sustainable development probably offers some solution.

Projected changes in global cereal production and prices and in the number of hungry people due to climate change, 2020s, 2050s, and 2080s



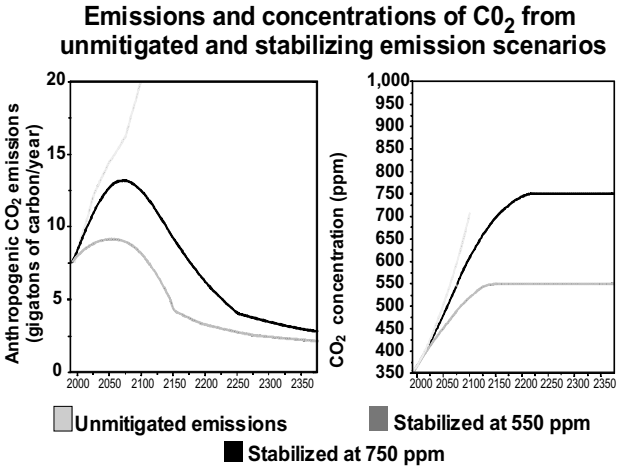
Source: Hadley Centre model, Jackson Environment Institute, Goddard Institute of Space Studies, and International Institute for Applied Systems Analysis.

FIGURE 7



Source: Hadley Centre model, Jackson Environment Institute, Goddard Institute of Space Studies, and International Institute for Applied Systems Analysis.

FIGURE 8



Source: Hadley Centre for Climate Prediction and Research, Met Office, U.K.
Note: ppm stands for parts per million.

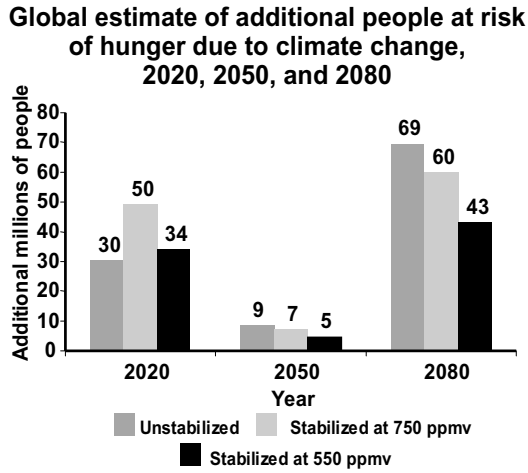
FIGURE 9

in Figure 10, unstabilized emissions leave 69 million people at risk of hunger, whereas an effort to reduce emissions 20 times greater than the Kyoto Protocol leaves 43 million people at risk of hunger (only 26 million less). Climate change mitigation doesn't have a dramatic impact on bringing down the risk of hunger. Why? Because, first, there are long time lags built into the climate system. We've been emitting carbon dioxide at a substantial rate for 200 to 300 years. There's a lot of warming bottled up in the oceans that will continue anyway. And, second, as we saw in Figure 9, those emission curves continue for a while before they come down.

Another solution, then, may be sustainable development. The IPCC has looked at two possible futures. The first is a world with a high population of about 11 billion; a world that has a certain amount of globalization but few global agreements, whether of a WTO type or a Kyoto type; and a world that is high growth but not equitable. The second is a world of local stewardship, a population of 9 billion, and reduced fertilizer use. It has, therefore, an average rate of economic development because it is using lower resources. Figures 11 and 12 show the effects of these two futures.

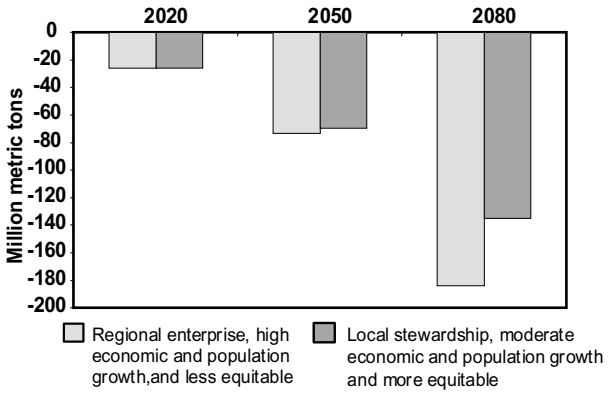
Figure 11 shows the reduction in global cereal production under the two development pathways. There doesn't seem to be a great difference in production, although, in fact, 100 million metric tons make a very big difference at the margins to the additional millions at risk of hunger (Figure 12). Not surprisingly, the additional 2 billion people in the high-growth world, and indeed the inequalities between these two different worlds, can produce very different levels of suffering as a result of the challenge of climate change.

To conclude, then, climate change is likely to have the effects I've already mentioned on precipitation, run-off, crop yield, hunger, and the rest. Regionally, or in some already semiarid areas, especially in Africa, these effects may be very marked. We need to refine the science of regional prediction of climate change a good deal before we can specify that in more detail.



Source: Martin Parry, Jackson Environment Institute, University of East Anglia.
Note: ppmv stands for parts per million by volume.

FIGURE 10

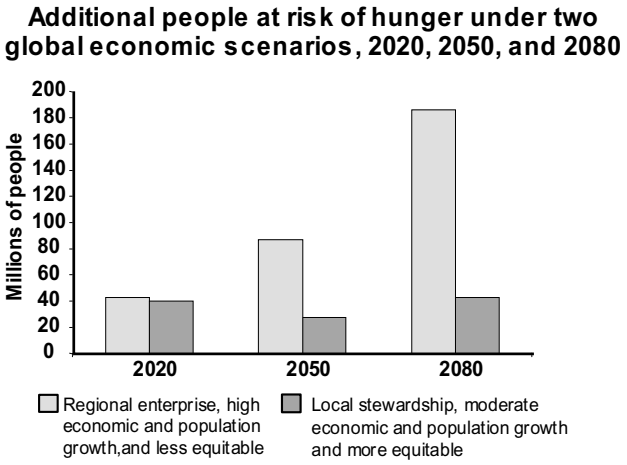


Source: Martin Parry, Jackson Environment Institute, University of East Anglia.

FIGURE 11

Subnationally, we can virtually predict that the most adverse effects will be at the political and economic margins. There will be a synchrony of climate change and other issues at the margins, and indeed these are areas where adaptive capacity is intrinsically low.

Stabilization or mitigation does not have a major effect, except that very high levels of stabilization would be very expensive. Therefore, we need to look at a future where adaptation and mitigation in the context of sustainable development probably offers some solution.



Source: Martin Parry, Jackson Environment Institute, University of East Anglia.

FIGURE 12

With regard to adaptation in agriculture, let me suggest some possible paths: technology—for example, crop breeding for climate change, whether by genetic modification or more traditional methods; management of farmland—for example, by using water more efficiently; and institutions that encourage change rather than fossilize change.

Many adaptations can be win-win solutions, because, by adapting to drought now, in areas that may become more drought-prone in the future, we meet the present challenge and the future challenge. And perhaps we already know enough to say that we should focus these early efforts on the most vulnerable areas—South Asia, Africa, and small islands.

We need to foster adaptation in the poorest areas because if we do not, that is if we allow adaptation to act autonomously, it will probably lead to greater inequality. South Asia's rich farmers will dig deeper to reach the water table, which will fall by 1.2 feet a year rather than 1 foot a year, making it far more difficult for poorer farmers to earn a living. The difference between the poor and the rich will—other things being equal, which, of course, they never are—become greater unless we foster adaptation among those that are least able to adapt.

Perhaps we need to concentrate on nonoptimizing objectives, reducing risk, and developing resistance and resilience in the face of climate change rather than maximizing and optimizing growth.

And, finally, let's not forget that climate change is probably occurring now. It's not some distant thing, and its effects could be significant within the next decade. Consequently, adaptation measures need to develop now rather than 10 or 20 years hence.

Discussion

Time constraints allowed only one question from the audience. A participant asked whether the model linking climate change with food supply took account of any adaptation mechanisms, because potential exists for solving some of the problems associated with drought tolerance and grain sterility. Martin Parry responded that the results accounted for autonomous adaptation at the farm level but not fostered adaptation.

Chapter 16

Complementary Technologies, One Goal: Approaches to Sustainable Food Production

Manuel de Jesús Reyes, a farmer from Honduras, offers his views on agroecological approaches to food production. Roland Bunch of Cosecha translated.

Chair: Klaus Ammann

Director, Botanical Garden, University of Bern*

We have an unfinished agenda. We also have an unfinished debate about what will be best for each country if it is to avoid hunger catastrophes in the future. This is the foremost task of this Conference, to find solutions. And the purpose of the session is to show you that actually there are many ways and many roads that give us solutions. I would like to make six broad statements.

First, I am against eco- and corporate imperialism. I think more decisions should be made by countries and regions on their own. We should all be open-minded. All of us have lots of gaps in our knowledge. We should listen to each other. We should not leave the field to a few experts with big mouths.

Second, I think organic farming and high-tech farming need to go together in the future. We simply have no time for ideological debates and battles over these issues. We should have a collaborative learning process instead.

Both of these seemingly polar strategies in agriculture, organic and high-tech, have advantages and disadvantages. So, my third statement is, let's benefit from the advantages and avoid the disadvantages. I'll give one example of the advantages of organic farming. Maybe not everyone is aware of Switzerland's 20-year-long experience with organic farming, wherein all the major proponents of different strategies got together and set up a field experiment, that really showed the disadvantages and advantages of each production method. To sum it up, organic farming showed lots of advantages when you looked at soil life. It had a bit less yield, but only a bit less. Other farming strategies also did very well. Strikingly enough, we now know through various field experiments that, for instance, the widely made claim that nontarget insects on transgenic crops cause considerable damage is not really true. You cannot distinguish the insect populations in transgenic and nontransgenic Bt maize fields.

But, and this is my fourth statement, we certainly need to monitor new technologies and establish regulatory frameworks for them.

My fifth statement is equally brief: Have a look at UNDP's *Human Development Report*, which states that we should not exclude modern agricultural technologies as a whole in our approaches.

The last statement is my dream: in the future, maybe 10 years from now, I'd like to smoke an organotransgenic cigar.

* Summary note included in Appendix 3.

Agroecological Approaches: Jules Pretty

Professor, Centre for Environment and Society, University of Essex*

The challenge facing us all is huge. If 800 million people are supposed to be brought out of hunger by 2020, I make that 80 people for each of the 10 million minutes between now and 2020. The challenge is so huge that we should be making the best use of whatever technologies we have available to us. I am going to talk specifically about some examples and concepts, some results and some challenges that relate to the agroecological side, but I do not reject anything that may benefit the poor.

...it is possible to increase substantially total food production in small farms.

The problem is well stated. Despite great success in food production in the past 50 years, both in the North and the South, there is still persistent food insecurity, still severe poverty, and at the same time growing damage to the natural resources on which agriculture itself relies: biodiversity, soils, and water. Some of that damage is caused by modern agriculture, some not. And we're going to be facing even greater challenges as the years go by with climate change.

So we have got these three options:

- We could expand the area of agriculture, but we are going to lose important goods and services from nature if we do that.
- We could expand per hectare production in agricultural exporting countries, but the poor may well be excluded. We have been very good at increasing production, but we still have 800 million people poor and hungry.
- We could increase total farm productivity in the countries that most need the food, either by using purchased inputs, technologies, ideas, or making use of locally available ones.

I am going to talk about the last option—using locally available technologies—because the concern is about access to technologies by the poorest. Quite frankly, we might have the best idea, but if people have got to pay for it, we have got a problem.

I consider sustainable agriculture to be three things. It is a type of agriculture that makes the best use of nature's goods and services, integrating agroecological processes into food production and at the same time minimizing the negative side effects on environment and on health. In other words it makes the best use of natural capital. Second, it makes the best use of human capital, building on the skills and knowledge and ingenuity of farmers and communities. And third, of course, is social capital, which involves people's capacities to work together to solve common problems. Quite clearly, if we are moving toward environmental improvements such as in pest, watershed, water, and forest management, then we know that we need people better organized to do that.

Now, it seems to me that the unique thing about agriculture when compared to other economic sectors, is that there is a circularity. Agriculture affects the very assets on which it relies for its success. And those effects can be either negative or positive.

So a sustainable agriculture, in my view, is one that improves these renewable assets, and if it improves them, then there are more assets for it to become better. Those assets are soils, water, and biodiversity. At the same time we can start to think about the creation of a range of other public goods, such as the carbon sequestration Pedro Sanchez talked about, as well as flood protection, landscape quality, biodiversity, and so on. This kind of sustainable agriculture can be delivered by all sorts of technologies.

Let me say a couple of words about some recent research that we conducted at the University of Essex, looking at progress toward sustainability in 208 projects in 52 countries. The

* Summary note included in Appendix 3.

survey looked at what was possible, and what has happened—it was not an average of agricultural development all around the world. If farmers make use of locally available resources, they are organized, and we build up their capacity and skills, then what happens? Anything interesting or not?

Well, the number of farmers surveyed was about 9 million on 29 million hectares. Most of the adoption of sustainable agricultural technologies and practices had occurred within the last decade. And most of the farmers were small farmers, with less than 3 hectares.

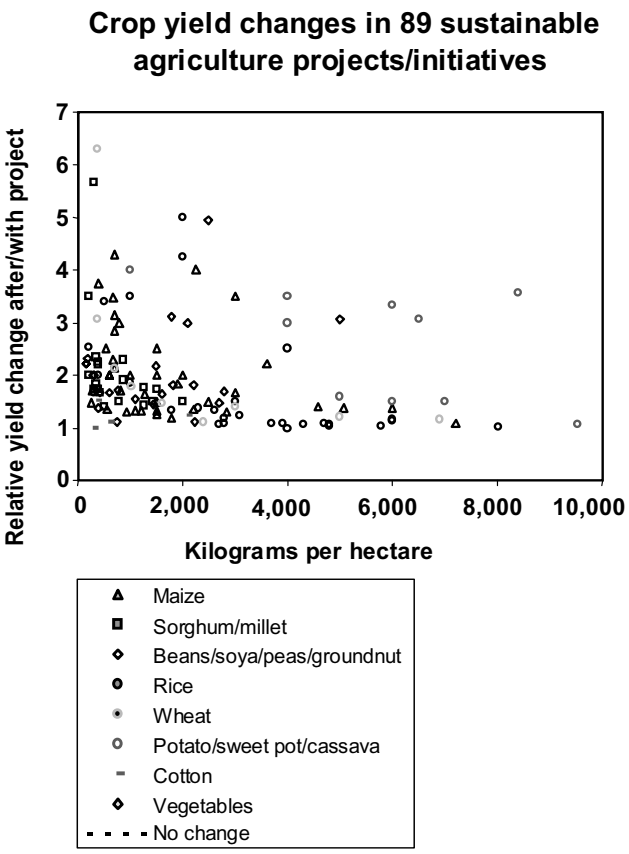
The research showed transformations are possible for small and financially resource-poor farmers. Figure 1 shows the relative yield changes for 89 of the projects where the data was very good, not the whole 208. The 1.0 line means there was no change in yield. The yield is relative, so 2.0 indicates a doubling in yield.

Thus it is possible to increase substantially total food production in small farms. You can see perhaps a relationship, a curve, which suggests that relative yield increases are larger on small farms. I would call this quite promising evidence that we can actually get it right.

Five key themes came from this research about the types of things that we can do to increase food production and benefit the poorest. The first of these is to intensify patches, such as in home gardens with raised beds, with fish ponds or with a dairy cow, for example, because in that way the food production gets to women and they make sure that food gets into the mouths of children. That is quite clearly a substantial benefit.

Agriculturalists have often missed that kind of thing. We have tended to ignore home gardens and other such things because we assume that we must work on the broad acres. We must do it on both, clearly. Big benefits in total food production do accrue if we go for patches, for bits of farms to begin with.

The second theme is the notion that we must improve the soil through the use of legumes, green manures, agroforestry, and zero-tillage. Anything



Source: Jules Pretty, University of Essex.

FIGURE 1

that increases the organic matter of the soil improves the productivity of the whole system—again, indicating the importance of building up natural assets. Agriculture both produces a good soil and relies upon a good soil. To my mind, that is the path toward sustainability. And, of course, you get an extra bang for your buck because about half the organic matter is carbon. And if we can lock it up, we have got a carbon sink as well to mitigate climate change.

Making better use of water is the third theme. Increasing crop intensity in the dryland areas through water harvesting yields big benefits because it can lead to step-wise changes in production. If you can go from one crop a year on a small patch of irrigated land in India to two crops a year, then that is a step-wise increase, not just a few percent. And that can happen through better organization in the first instance and use of the rain that does fall.

Another way to use water better is, of course, better irrigation scheduling, again, delivered by social capital in water users groups.

The fourth lesson is about functional biodiversity, making better use of the services farmers derive from biodiversity both onfarm and around the edges of farms. My view is that in many systems we are moving toward minimum to zero pesticide farming. We have become very familiar with zero tillage, particularly in Latin America. I think in many systems we can bear down very heavily on pesticide use, with benefits to human health—depending on the products that we are eliminating—and an additional benefit in terms of biodiversity, which then can survive and provide the natural pest management services we need. In irrigated rice systems, zero pesticide farming may well mean that you can put fish back in rice fields, which means a much greater increase in protein availability.

The fifth point centers on the importance of social and human capital, which are, to my mind, prerequisites for all the other themes. Building people's knowledge and their capacity to work together are vital for sustainability. The metaphor I use when we're thinking about agroecology is to think of fields as being full of megabytes of information. It is the Information Age, after all. But the trouble is we're still working in an ancient operating system, and have not even discovered Windows. We have an awfully long way to go to understand that complexity and to move it forward.

My final point is to say we understand quite well the technologies and social processes for making things happen at a local level. I think we understand better the social and institutional processes that have helped things spread to quite large areas. The least well understood and supported are the political conditions for the spread of these kinds of agriculture. There are, after all, only two countries in the world with an explicit national policy for sustainable agriculture—only two.

I will finish with two quotes. The first, from the distant past—I was trying to find a quote from 2,020 years ago, but 2,200 is close enough—Marcus Cato, the Roman writer, when he wrote about agriculture, said this: "And when our ancestors would praise a worthy person, the praise took this form: good husbandman, good farmer. One so praised was thought to have the greatest commendation." And here is a final quote from Tamil Nadu, India, which I am rather fond of: "The land without a farmer becomes barren." Our challenge is about building farmers' capacity, both female and male, to manage resources better and to increase productivity.

Agroecological Approaches: Manuel de Jesús Reyes

Farmer, Honduras

Translated by: Roland Bunch, Asociación de Consejeros para una Agricultura Sostenible, Ecologica y Humana (Cosecha)

I am a farmer, and ever since I was a little child, I learned traditional agriculture from my father. That consists of burning the forest and then cutting it down to open new fields. But that kind of agriculture was not really adequate for our consumption. It didn't provide even enough to eat, much less for our economic needs. Also, the production was good for only one year, and then the soil was so bad that we had to let it rest.

We had to leave the land we were working and move to another part of Honduras to find better land. Still, many times the maize we produced wasn't enough, so we had to subsist on just bananas. Then in 1993, a farm extensionist arrived in our community from the organization called Cosecha. He brought technologies for a kind of agriculture that was more ecological and more sustainable. The main

Building people's knowledge and their capacity to work together are vital for sustainability.

technologies he brought were green manures, in-row tillage, and zero tillage.

The green manure covers crops intercropped with maize. This technique serves both to control the weeds among the crops and to improve the soil fertility. It tremendously increases the productivity of leaves, which will be used to fertilize the soil, and also improves the productivity of the maize crop for eating.

In-row tillage consists of opening up or cultivating in rows, leaving the area between them uncultivated, for both soil conservation and improvements in yields. This technology both reduces erosion or conserves the soil and at the same time increases soil fertility. It increases the soil fertility because we are incorporating organic matter into the row, and the rows are on a contour.

We also control insect pests through natural means, using such things as cooking oil, the leaves from *Gliricidia sepium*, trees, chili peppers, onions, and garlic.

Previously, with traditional technologies, we produced about 0.6 ton per hectare. Now I am producing between 2.5 and 3.0 tons per hectare of maize, which is more than we can eat. We have a lot of grain to sell. Also, I never had to take out any kind of a loan to adopt this technology because it costs virtually nothing. I tried it out on a small piece of land, and then I gradually increased the land surface that I dedicated to these technologies.

Traditionally, we used a lot of chemical fertilizer because our soil was very poor. Little by little, I have used less and less chemical fertilizer, phasing it out not completely but largely, as the soil becomes more fertile.

Some of my neighbors still use a lot of chemical fertilizer in traditional systems. They are in a very precarious situation presently because they have to take out large loans that have very high interest rates. Furthermore, last year there was a drought that left them unable to pay their loans. Now they are in danger of losing their land.

A lot of other families in my community now have begun using this technology and have been able to secure their food supply.

I never thought I'd have extra grain to sell above and beyond what I needed to consume. A lot of other families in my community now have begun using this technology and have been able to secure their food supply.

Just recently, because of the drought, the World Food Programme arrived in our community to look at it as representative of the area and studied quite closely the nutritional situation there. They were very surprised because in Honduras in general, more than 60 percent of the rural population is malnourished; whereas, in my community, they found that only 1 percent of the population was malnourished.

All of us who are poor can do many of the same things. We should all be able to have enough food using these practices to eat and to eat all we want.

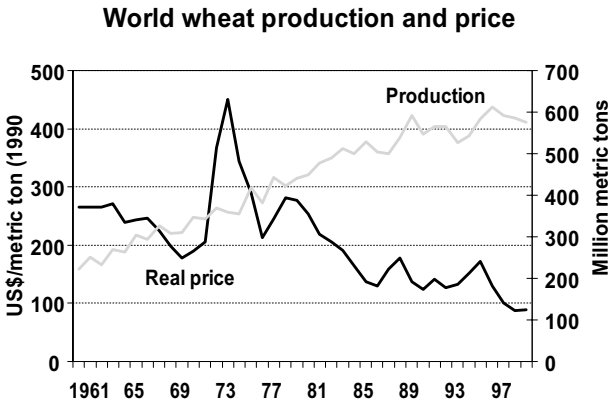
Conventional Approaches: Prabhu Pingali

Director of the Economics Program, International Maize and Wheat Improvement Center

I believe strongly in the integration of modern biotechnology tools with conventional breeding methods. If such integration does not take place, then we are in danger of losing the potential productivity gains that can come from biotechnology.

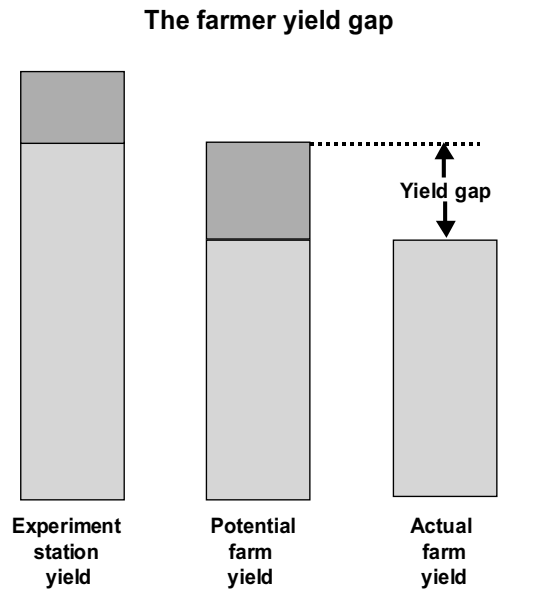
I'd like to make three points in my presentation. First, the gains that we can make from conventional breeding and crop management and agronomy research have not been totally exploited yet. Second, the pipeline of research from conventional technologies is still full, is still providing a steady stream of results. And third—a reiteration of the earlier comment—a marriage between the various approaches is absolutely essential.

Before I go through those points, I'd like to take a moment to celebrate the success of conventional research. The big celebration, of course, is



Sources: ERS, USDA-2001; deflator IMF–2001; FAO, FAOSTAT Online 2001.

FIGURE 1



Source: Prabhu Pingali, International Maize and Wheat Improvement Center.

FIGURE 2

the production increase and the price decline for wheat. But I could show you a similar graph for rice, for maize, and for some other crops as well.

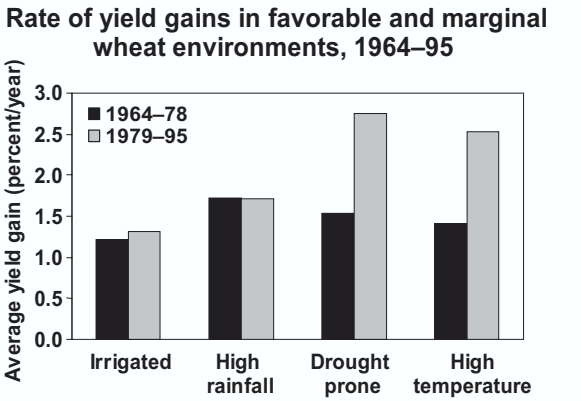
The second statement I'd like to make is that most people, when they think about the impact of the Green Revolution, they think about it in terms of irrigated environments. But there has been substantial progress in the use of modern technology in rainfed areas. They started late but they've caught up quite a bit, especially in wheat, but also in rice and maize.

Still, productivity gains from conventional technologies have not yet been fully exploited. Look at the yield gap that exists on farmers' fields (see Figure 2). If you look at rainfed environments, the yield gap between the potential economically viable yield level and what farmers actually get is anywhere from 3 to 5 tons. In marginal areas, this gap could be explained in terms of access to technology, seeds, inputs, and so on. But you see a similar gap in the irrigated environments. You see a gap of 1 or 2 tons between the possible and what you actually achieve on farmers' fields. And here the difference is not because of access to technology or because of differences in access to inputs. The gap exists because farmers and scientists have different information about how to maximize productivity on those fields.

...the gains that we can make from conventional breeding and crop management and agronomy research have not been totally exploited yet.

These knowledge-intensive technologies have not been able to get to the farmers in the same way that seeds have been able to get to the farmer. And the considerable productivity gap in the more favorable environments needs to be bridged at some point.

The second area in which exploitation of the existing potential is possible is in very intensive production systems that have faced declining productivity over time. Much of that decline in productivity has taken place because of intensification within a policy environment that does not encourage sustainable intensification over time. Let me give a quick example. As long as irrigation water is free, should we be surprised that farmers overuse water? Should we be surprised that we see a lot of water-induced degradation taking



Source: M. Lantican and P. Pingali, "Growth in Wheat Yield Potential in Marginal Environments," proceedings of the Warren E. Kronstad Memorial Symposium, 15–17 March 2001, Ciudad Obregon , Mexico (El Batan , Mexico: International Maize and Wheat Improvement Center, forthcoming).

FIGURE 3

environment that does not encourage sustainable intensification over time. Let me give a quick example. As long as irrigation water is free, should we be surprised that farmers overuse water? Should we be surprised that we see a lot of water-induced degradation taking place in irrigated systems? As long as water price reform does not take place, there's no incentive at the farm level to improve efficiency, and therefore you see much of the productivity loss taking place in these areas.

The conventional research pipeline continues to provide a steady stream of products. Over the next 20 years, that will be very important for productivity. During the Green Revolution period, much of the increase in production came from yield growth and irrigated environments. But over the last 20 years, the yield potential for drought-prone environments and for high-temperature environments has been rising very rapidly. For drought-prone environments, the yield potential has been rising at the rate of about 2.5 percent per year. Figure 3 graphs the wheat yield gains in favorable and marginal areas. Similar graphs could be drawn for drought-prone maize material and some for rice. This research material is out there, and it's ready to move into farmers' fields, and in many cases it is moving into farmers' fields.

...it is absolutely crucial that we look at a marriage of conventional technologies with novel approaches.

Another area where you see a steady stream of improvement is
one that plant breeders keep working on but don't usually get too much credit for—the less glamorous area of maintenance research. This includes work on better pest resistance and work on improved tolerances to a variety of stresses such as drought, soil problems, soil acidity, and so on. In addition, over the last 40 years, the crop cycle has been reduced significantly. The number of days needed to grow a crop has gone down substantially over time, and this allows for a second crop, a third crop, or a diversification of crop systems to take place in an intensively cultivated system.

We also know that over time the eating quality of grain has improved, and so has nutritional quality. Last year, two scientists from CIMMYT were awarded the World Food Prize for their work on quality protein maize. That's one example of the way in which plant breeders have improved nutritional quality over time.

The last point is that, as I said earlier, it is absolutely crucial that we look at a marriage of conventional technologies with novel approaches. Biotechnology is a specific case in point, but certainly agroecological approaches are a part of this paradigm also.

If you look across the technologies that are used today—genetic fingerprinting, molecular marker-assisted selection processes, and tissue culture— these three so-called biotechnologies are already well integrated into breeding programs in most developed countries, and also in a lot of developing countries. Countries such as my own—India—China, even countries like Kenya have very strong programs where breeders have been integrating many of these tools. In fact, most biotechnologists would probably call these first three conventional technologies now. But the next stage of

integration will come in the areas of genetic engineering. That's the area that is most controversial at the moment. But over time, that's where much of the integration is going to take place.

Finally, the knowledge that genomics can bring to crop breeding is enormous in terms of understanding the potential economic value of different genes and then understanding how to bring them into the breeding pools, and so on.

This is a great time to be in the agricultural research business. An enormous set of opportunities is available for improving crop productivity. The complementarity of the tools that exist is quite spectacular. The problem is that disciplinary isolationism is still a problem. What we need is more integration across disciplines and across the tools that we possess in order to improve food security for all.

Conventional Approaches: K. Rajarathinavelu

Farmer, Allivaram Village, Tamil Nadu, India

I, Rajarathinavelu, am a farmer and a son of a farmer hailing from Allivaram village in Vellore district, Tamil Nadu, India.

Agriculture is considered the primary sector in our country, employing nearly two-thirds of the population. Following the same trend, agriculture is the mainstay of our village. Rice is the primary crop cultivated by our forefathers and by us too.

Rice is the staple crop of the state. It is cultivated year-round, with 11 distinct seasons observed in rice cultivation in the state. Vellore district has a sizable area under rice crop: it occupies nearly 30 percent of the total cultivated area in the district and is cultivated in 3 of the 11 seasons in the year.

During my father's tenure, developments in agriculture were constrained by little quantity and highly fluctuating levels of rice production. The rice yield was insufficient to satisfy the needs of the farmers' families, and this was reflected in farmers' standard of living. This phenomenon was quite pronounced, especially in the holdings of small and marginal farmers who had very small acreage under plough.

Traditional varieties of rice include *Kichadi Samba,* a long-duration superfine variety used for daily consumption both raw and boiled, and *Kullangkar,* a short-duration bold variety used for preparation of South Indian rice dishes like idli and dosa. Agriculture worked along traditional lines, without any chemical nutrients or pesticides. Animal power was the only source of farm power to carry out land preparation. Seeds were farm-produced, and the seeds for the next season were selected from the harvested produce, based on the phenotypic character of the seeds. Nearly 150 kilograms of seeds per hectare, irrespective of the variety, were sown. Farmyard manure and green leaf manure were the main sources of nutrients. *Neem* and *Pongamia* were the major constituents of green leaf manure. Approximately 40, 15, and 35 kilograms of nitrogen, phosphorous, and potassium, respectively, were added to the organic manure. Grasshopper infestation was considered a pest problem, and cows' urine and extract of *neem* cake were used to keep the pest at bay. Farmers were not aware of damage from disease incidence.

Labor was plentiful, and working hours were long. Wells were no more than 30 feet deep, and water was lifted using bullock power. In spite of the substantial efforts, these crops, owing to their inherent capacity, yielded an output that did not match the farmers' needs. The meager production had a serious impact on the village economy. The share of rice, which is the staple food, in the farm family's budget was huge, and it automatically curtailed the funds for other developmental purposes for the family. The standard of living of small and marginal farmers and agricultural laborers was precarious.

In this situation, a wonder happened. My father is an innovator, and he introduced a short-stature rice variety called IR-8 in the village. It has been a boon, not only to our family or the village or the district or the state, but to all of India. For the first time, our village folk saw a huge number of grains

in a panicle and large number of tillers in a clump. All the farmers, from marginal to large, were extremely happy and considered this variety a savior. The dawn of this revolution opened the gates of prosperity in the village.

The process of mechanization slowly crept into the village. Installation of an oil engine to draw water from the well started in 1965. Gradually more area benefited from assured irrigation, and the area under rice cultivation increased. Electrification of pump sets was really a fortunate thing, and we had electricity from 1969 onwards. Now in the district nearly 94,000 wells are energized by electricity.

A big farmer in a nearby village purchased a tractor in 1974, and tractors progressively occupied the prime position in performing various agricultural activities. Because of this "dream machine" we were able to complete the land preparation in time. The tractor population in the district has risen to 1,165. To control rice pests, farmers opted for chemicals. Stem borer, leaf folder, and brown plant hopper were the major rice pests in the area. Since acquiring knowledge about the ill effects of pesticides, farmers now depend on plant derivatives like neem seed extract, neem cake, and other eco-friendly pest management strategies. Right from the late 1990s, cases have been registered in our village where not even a single dose of plant protection spray was resorted to in rice cultivation. For nutrients also, we have shifted to need-based fertilizer application. Judicious combinations of organic and inorganic sources are used. Farmers in the village apply azospirillum and blue-green algae in rice cultivation.

The new technology—namely seeds, fertilizer, plant production, machinery, and irrigation—worked excellently in the village. The yield recorded an unimaginable threefold increase, and farmers were able to get 8,500 kilograms per hectare. Hence, the villagers thought the IR-8 variety was a godsend. In a gesture of tribute to the variety, some farmers in the state baptized their children with the name IR-8. The characteristic features—high-yielding capacity and nonlodging nature—were the main reasons farmers preferred this variety.

The benefits of the Green Revolution have trickled down to the small and marginal farmers.

Successive introduction of high-yielding varieties has sustained the tempo of increased rice production. Since the introduction of the IR-8 variety, the urge for other improved varieties increased among the farmers. Accordingly, new varieties like ADT 27, IR20, and white PONNI were introduced and gained support from the farmers. In the 1980s, varieties like IR50, ADT 36, TKM 9, and CR 1009 were the promising rice varieties among the farmers of the village. In the 1990s, rice varieties like ASD 19, ADT 39, TKM 11, and improved white PONNI were the popular varieties.

Now technology is available at our doorsteps, thanks to the work of the state government. We adopt the seed rate, nursery duration, fertilizer dosage, plant protection schedule, irrigation management, and other postharvest technologies as the state recommends. The technology that helped triple the yield has also paved the way to sustain the same. We have reaped not only the additional rice grains but also the other benefits of the Green Revolution. The drudgery of labor has lessened considerably because of mechanization. Now laborers have enough time and energy to take care of the developmental activities of their family.

The increased yield on a sustained basis has changed the village in many constructive ways. The benefits of the Green Revolution have trickled down to the small and marginal farmers. Their standard of living has increased. Now they send their children to school, even to expensive private schools, and bestow their attention on their education. In recreation and other amenities, they now possess radios, televisions, and mopeds. Prior to the 1970s only a handful of radio sets were available in the village; and during the early 1980s, possession of a black and white television set was considered a status symbol. Now almost all the

households possess any one of those amenities. Everyone can afford the better medical facilities. The basic feature underlying all these phenomena was increased rice production in a sustained manner; and if not for the Green Revolution these benevolent happenings would not have occurred in our village. We farmers are ever indebted to the agricultural scientists for bringing such a revolution in the farm sector. It not only improved the economy of the country but also the economy of farmers like me.

Biotechnological Approaches: Jennifer Thomson

Professor of Microbiology, University of Cape Town

Biotechnology covers many things, as we have heard. I would like to focus on genetic engineering, and speak from the perspective of Sub-Saharan Africa, as South Africa is part of Sub-Saharan Africa.

We need a doubly Green Revolution. The Green Revolution started in the 1940s, largely in Mexico, although we just heard what the effects were in India. It increased yields through breeding and the use of fertilizer, and in 1948 Mexico became self-sufficient in maize for the first time since 1910. The Green Revolution was less successful in Sub-Saharan Africa. In fact, the yields there have not changed in 40 years, and cereal production per capita is steadily declining.

Thus, in the words of the president of the Rockefeller Foundation, Gordon Conway, we need a doubly Green Revolution, and part of that doubly Green Revolution is the use of genetically modified crops. I do not say it's the only answer, but it's part of the answer.

What do we need from agricultural biotechnology? What research do we need to do in Africa? We have heard that it's important for those of us in the developing countries to look after our own problems. You will see that is a theme running through my talk. We need virus resistance on viruses that are important in Sub-Saharan Africa. Probably the most important of these is one that's endemic in Africa. It's called maize streak virus, for obvious reasons, and it causes huge economic losses to both commercial and small-scale farmers.

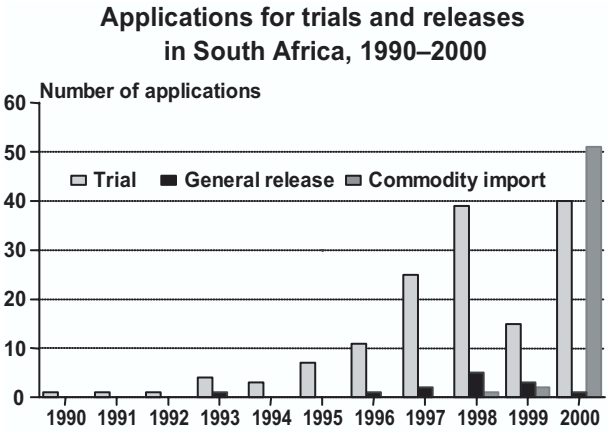
So virus resistance is important, and I'm happy to announce that about three or four months ago, my lab produced our first maize streak virus-resistant plants that are entering into field trials. Scientists in South Africa have also developed virus-resistant potatoes. And in a wonderful international public-private enterprise, scientists in South Africa, Kenya, and the United States are developing cassava resistant to the African cassava mosaic virus—again, another Sub-Saharan African problem.

We also need drought tolerance. I predict that wars could be fought in Africa and other countries over access to water. We've heard a lot about that, particularly in that seriously challenging talk on global warming.

In my lab, we've taken genes from a plant we call a resurrection plant. When it's hydrated, it's green and wonderful. When it's dehydrated, it looks totally dead. It has lost its chlorophyll. But if you add water to the dehydrated one, it returns to the hydrated form. It resurrects itself in 72 hours—a pretty dramatic effect. Of the 100 or so resurrection plants worldwide, about 90 are indigenous to South Africa.

So we have taken genes from this particular resurrection plant. We chose it because it's a monocot, and the cereals of life are mainly monocots. And experience shows that, mostly, genes from monocots express best in other monocots. People here have asked if it grows in the desert. No, this particular one grows in cracks in rocks, often next to water. But you can imagine if sun beats down on that, that could dehydrate very rapidly. So that's our source of genes, and I'm happy to say that we've got some very exciting results.

Fungus resistance is also important. There are both postharvest fungal infections and also preharvest fungal infections. One of the most important things about fungal infections is that they produce mycotoxins, which produce serious toxins. These serious toxins cause things like toxic hepatitis and liver and esophageal cancers—really serious diseases.



Source: Jennifer Thomson, University of Capetown.

FIGURE 1

We also need insect resistance. This is one area we're not developing ourselves because there's plenty of Bt around. But let me describe some of the results of field trials we have done on insect-resistant cotton in South Africa. In 1997, we persuaded four small-scale farmers to participate in a field trial using Bt insect-resistant cotton. The results were so spectacular that the next year we had no trouble getting 75 participants. In 2000 the number was 644. And this year it has escalated even more dramatically. That is money in the small-scale farmer's pocket. And because these farmers are not spraying, we're getting an increase in nontarget insects, birds, and even frogs.

Bt maize that is resistant to being nibbled by insects does not have holes in it. If you're a small-scale farmer and store your maize in sacks under the eaves of the hut, it gets rained on and it gets hot. Insects will nibble on it, creating holes, which are a perfect breeding ground for fungi and the production of toxins associated with those cancers. Hence the production of toxins is more likely on insect-sensitive maize than on Bt maize.

I thought a graph of the applications for trials and releases in South Africa over the past 10 years would be of interest (see Figure 1). There was a glitch in 1999 when, due to a change in policy, control was transferred to a government department. A genetically modified organisms (GMO) act was passed, but it took a while for the whole thing to get active. Now that it's active, you can see we're getting lots of requests for both trial and commodity releases.

A little passion of mine is something slightly different. It's not food, but I think it could be terribly important for health and HIV resistance in Africa. And that is the use of plants to make edible vaccines or simply to use plants, perhaps marijuana, to produce vaccines that we can harvest and have in edible form. When I was a girl, there was a polio outbreak in South Africa. At school we were given sugar lumps that were impregnated with the vaccine. It's exactly the same principle.

Trials have been done in America with vaccines produced in raw potatoes, but you're not going to get children to eat raw potatoes. If we could produce them in bananas, with our good African transportation system, that would be great.

Why does Africa need agricultural biotechnology? If our present productivity remains the same—and as I said, it's actually going down in Sub-Saharan Africa—we're going to have a shortfall in grain by the year 2025 of about 90 million tons of cereal. The Middle East is slightly worse off, but they've got money, they've got oil, so they can import things. We don't have money in Sub-Saharan Africa.

I want to conclude by saying there is good news coming out of Africa. I urge you to read more about this in an article by Eleni Gabre-Madhin and Steve Haggblade in the August edition of IFPRI's 2020 Vision newsletter, *News and Views*. At this Conference itself we have seen Thrishni Subramoney, a South African, win the 2020 Vision international youth essay contest, and four of the five runners-up are from Africa. So there's good news coming out.

I also want to note that two of South Africa's top agricultural government officials are here at this conference: Thoko Didiza, our minister of agriculture, and Bongiwe Njobe, the director general of

our Department of Agriculture. They are both keen supporters of biotechnology, and, in fact, the South African Cabinet recently passed a strategy document on biotechnology.

So my conclusion is that as far as agricultural biotechnology and food sustainability are concerned, watch South Africa, watch for more good news!

Discussion

The two most prominent points emerging from the discussion were the need for a marriage of all technologies and the need for further research and assessment. Other topics included the importance of national and international policies, the value of farmer experimentation, and the roles of the private sector and public institutions.

The first key area of discussion concerned marriage between technologies. Several participants agreed that in the marriage between conventional research and biotechnology, it is essential to include indigenous knowledge as well. Prabhu Pingali reiterated the importance of marrying all three technologies, noting that often our knowledge about land races—wild species closely related to existing crops—comes from indigenous knowledge at the local level. A participant indicated that large amounts of money are being placed in the unknown technology of genomics, which at this point is only benefiting the large companies, therefore, more focus and attention should be placed on the agroecological approaches.

Manuel de Jesús Reyes and Roland Bunch raised the importance of farmer experimentation. Farmers have discovered inexpensive ways of making water-holding basins impermeable for water harvesting. This technology could be extremely valuable because farmers could store water and save at least part of their crops during a drought. Farmers in Central America have also done a tremendous amount of research on managing green manure cover crops, which can do two things for soils. First, they can lead to zero tillage, which has been spreading rapidly across southern South America to millions of farmers and can eliminate the need for soil preparation. Second, green manure cover crops provide weed control. These two qualities allow small farmers to compete with tractorized farmers. Cases were cited in which farms using these technologies are producing maize for up to 30 percent less cost than modern tractorized farms. Therefore, more attention to farmer experimentation, even by small farmers, was encouraged.

Requests for further research and a higher level of funding for that research were another key area of discussion. Several participants raised the need for proper assessments of new technologies in areas such as environmental impacts and economic costs and benefits. A participant noted that Africa suffers from a lack of capacity to do risk assessment. High yields and economic benefits are discussed on a large scale, but no one mentions how many dollars a new technology can actually put into the pocket of

a small farmer.

In response to the discussion, Pingali stated that a transparent evaluation of the various approaches is needed, in which the different players agree on a method of evaluation, a method of data collection, and even definitions. Much of the debate on agroecological approaches or biotechnology has persisted for so long because people have been unable to sit down and agree on even the basic definitions. Jules Pretty agreed with the need for a proper assessment of agricultural technologies, adding a need to assess whole systems. He noted that, for example, the external environmental and health costs of modern agriculture in Britain totaled an estimated $2 to $3 billion—greater than net farm income. Pretty cautioned that the term "efficient" should not mean being very good at externalizing lots of costs so a cost base looks small and letting other people pick up those costs. If we are concerned with a transition to sustainability, we must think about both the internal success of systems and the external costs and benefits. More research on full cost accounting of both the benefits and the risks of using certain technologies and systems was urged. Pretty added that a weak sustainability position is one in which we seek to produce food while simply protecting the environment. A strong sustainability position is one where we seek to produce more food while improving natural capital, goods, and services, because that circularity leads to the kinds of virtuous cycles that we want in due course. In Pretty's view, only two countries in the world have explicitly put sustainability at the center of their policies, so there is a long way to go.

A participant addressed the gap between knowledge and practice with regard to new technology. There is already a gap between what is known about conventional agricultural research and what is being applied. In the more complicated area of biotechnology, the national research institutions that already face constraints in research equipment and resources will lose out even more. Much of the biotechnology research is lodged in private institutions or organizations that by their own admission are not doing it for free; they are doing it to cover their costs. The participant noted a consensus at the Conference, indicated by the voting, that biotechnology research should move back to public research institutions so that the more general public can benefit. The participant continued that although biotechnology may contribute much in developing countries, the importance of conventional research cannot be ignored. In response, Jennifer Thomson agreed that it is important for developing countries to maintain their research in public institutions. Although public-private partnerships can be encouraged, in order to make these technologies affordable in developing countries, funding should stay in the public domain.

Another topic raised by a participant was the cost-effectiveness of overcoming the yield gap. Pingali responded that in almost all instances, the yield gap is related to

socioeconomic and policy issues. If there is a gap associated with a particular physical stress, then that is a technology gap that will exist until there is another technological breakthrough. However, the gap that exists on farmers' fields is a socioeconomic gap related to infrastructure, institutional constraints, and policy constraints. Overcoming that gap would be cost-effective, but changing institutions or building infrastructure depends on everything from globalization and market access at the country level to improving farm roads at the local level.

A number of participants expressed concern about the lack of research on the biosafety of genetic engineering. One participant's view was that many people are concerned about biotechnology not because they believe it has no use but because they believe it is crucial to gain a better understanding of gene ecology in order to assess the actual benefits and the risks of the technology. If you let something out into nature and there are problems later on, the participant added, you cannot recall it like a bad car. In response, Thomson indicated that recent projects are beginning to study the effects of genetically modified crops on biodiversity and the environment, and although it is late in coming, this research is indeed important. Although some of the effects are marginal, they are not absent. A concerted effort is required to bring information to the public and to bring risk-benefit analysis to the farmers. Pingali added that the ability to talk about the ecological impact of particular transgenic crops depends on understanding indigenous knowledge. In any ecological assessment, one should start with indigenous knowledge, identify the local plants that could be affected, and then work backward from there to assess risk.

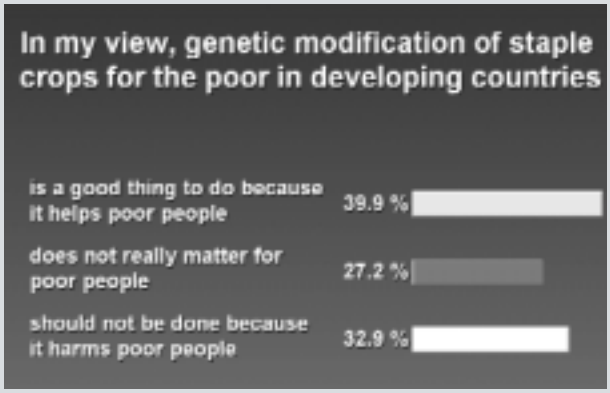
In reaction to a participant's comment about a lack of research on the human health risks of biotechnology, a lack of convincing safety tests, and the amount of money being put into an unknown technology, the Chair, Klaus Ammann, said that 3 billion meals with biotechnologically produced ingredients have been served in the United States over the past seven years, and not even a headache has turned up. The Chair agreed that a baseline for food safety is necessary but added that we should also question the food safety of plants with mycotoxins, for example. In response, the participant mentioned a few peer-reviewed studies on food safety and said that two found negative effects on the intestines. The participant continued that there is a need to study all issues of food safety, including plants with mycotoxins, but a great deal of research already exists in that area, whereas it is not present in the transgenic area.

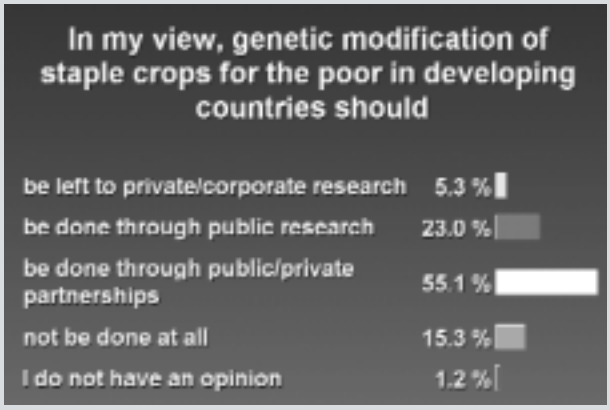
The need for further research on agroecological systems, including organic farming and smallholder farming, and more formal funding of these systems was identified. Mainstreaming those practices, principles, and systems is an important policy option. Other participants expressed agreement with this need. Another comment expressed a need for more research on conventional technologies that work, such as tissue culture,

to produce virus-free crops.

The importance of policies was raised. A participant indicated that because Honduras is a mountainous country, only 18 percent of its land is arable. The interior valleys are in the hands of large landholders, and international groups use the fertile coast to grow pineapples and bananas. Small farmers are forced to use marginal lands. It is important to think about how national and international policies affect the land. In reaction, Pretty agreed that getting the policies right is a major challenge. Progress has occurred in various sectors—support for tillage in Latin America, support for water user groups, support for farmer field schools—and these are promising changes at the edge of mainstream agricultural policies. However, too few countries have sustainability explicitly at the center of their policies. Pretty added that the use of the word marginal is problematic, because if farmers successfully make use of agricultural systems, they are turning marginal land into successful land.

Conference Opinion Poll*





**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

A participant drew attention to the role and agenda of private companies, noting that during the year 2000, 99 percent of the entire genetically modified crop area was sown with seeds from five multinational corporations, covered four crops, extended over three countries (Argentina, Canada, and the United States), and focused on products with two traits (herbicide tolerance and insect resistance). The participant remarked that while the Conference participants have talked a lot about the unfinished agenda, the control of the corporations is the unmentioned agenda and must be discussed.

During the discussions, several other issues were raised. A participant asked who is trying to find out what kind of improvements farmers desire. Are the research institutes giving thought to the kind of improvements that farmers need? Who is

setting research priorities? Another participant expressed concern over the affordability of genetically modified cereals for small farmers. Another comment suggested learning from the mistakes of the Green Revolution, noting that not all areas or countries (particularly in Sub-Saharan Africa) benefited from the technologies introduced. New technologies, particularly biotechnology, should be discussed in totality, and more research should be done before they are introduced.

In closing, the Chair, Ammann, identified a need for more baseline approaches that do not focus on transgenes alone in risk assessment. He reiterated the need for a marriage of the various approaches, including the knowledge of indigenous peoples. He conveyed his belief that modern agriculture can be improved, but that it needs more, and more balanced, funding. Organic farming and smallholder farming need to be better researched and supported. The Chair agreed that government research should be reinforced but also called for working closely with the life science companies.

Chapter 17

Troubled Water, Water Troubles: Overcoming an Important Constraint to Food Security

Chair: Margaret Catley-Carlson
Chairperson, Global Water Partnership

It is an enormous paradox that we live on a watery planet. Water is everywhere, and yet water crises are more and more in the news. Everyone talks with confidence about probable water crises of the twenty-first century.

Why is this? It is a matter of available water and, in particular, available water per capita. Available water refers to the fact that, even though our planet is covered with water, a lot of it is salty, locked up in ice, and simply not available. In Canada, the Mackenzie River has huge flows of water, but it doesn't do people much good. It does the biosphere a lot of good and the ecology up in the north. But in terms of available water per capita, you have to look at a very particular kind of water.

What can reduce available water per capita? More "per capita" is the first thing. As John Bongaarts told us, our population has increased since 1950 from 3 billion to 6 billion and is projected to increase again from 6 billion to 9 billion by some point around the midpoint of the century. Therefore, the available water per capita is going to go down a great deal more.

Pollution can change available water per capita because, if the water flowing by is not usable, it isn't available. Weather events and floods can change available water per capita because, if all the rain that falls in an area falls in three days or three hours, it isn't really available. It goes by in torrents. Even though in a statistical sense the rainfall may look like an adequate amount, in fact, it isn't available. And climate change will probably make a difference as well.

When we start looking at this inexorable reduction in water per capita, water for agriculture is one of the really big topics. More than 70 percent of human use of water is for agricultural purposes. Only 17 percent of agriculture is irrigated, that is, not using just rainwater but using irrigated water. With that vital 17 percent we produce 40 percent of the world's food.

When we talk about adding another 3 billion people, that implies we need to improve agricultural productivity, which in modern times has come to mean increasing irrigation. But increasing irrigation would require more available water, and more available water in many instances simply isn't there.

While population trebled, water demand went up by a factor of six. Water stress is everywhere. The Yalu and Colorado Rivers no longer reach the ocean. Ten percent of the Nile now reaches the Mediterranean. Aquifers are being drawn down. About 20 percent of freshwater fish species are extinct or seriously threatened. Dams and water storage cause endless controversy and are seen as less of a solution than in the past.

And our cities build up as well. Urbanization proceeds apace, and these are thirsty cities, meaning the number of cities with water stress is increasing, too.

The number of human beings under water scarcity is now in the hundreds of millions. That is likely to move to outright water stress, and the number will go up significantly.

Keynote: Frank Rijsberman

Director General, International Water Management Institute

Water is one of the most important constraints to food security. Agricultural scientists often tell us that the Green Revolution was based on high-yielding varieties and fertilizer. I believe that the development of reliable irrigation has been crucial to realizing the benefits of those high-yielding modern varieties. Not enough people know that a key ingredient of the Green Revolution was the investment of billions of dollars in water management, in irrigation. In fact, the increased food production associated with the Green Revolution has come hand in hand with very sharply increased water use in irrigated agriculture. In the previous century, the population increased about three times and water use, mostly for agriculture, increased six-fold. This irrigation has benefited farmers and the poor variously, both negatively and positively. And it certainly has also damaged the environment. Roughly half the world's wetlands disappeared in the previous century.

As populations rise, incomes rise, and countries industrialize, the demand for water in cities and urban areas by industry and people will increase sharply in coming decades. At the same time, greater environmental awareness will place more and more value on maintaining a healthy environment both for people and for the environment itself, for nature. So large-scale development of rivers and groundwater, as we saw in the last few decades—between 1960 and 1990, when most of the 45,000 large dams in the world were built—is unlikely to be repeated in the coming decades.

In addition, a lot of the water infrastructure that has been built is getting obsolete. A lot of reservoirs are filling up with silt. Irrigation systems are crumbling. And there is less and less willingness, apparently, on the part of the development banks of this world to invest in the development of new water resources.

Groundwater levels are falling in key aquifers. One of the speakers said aquifer levels are falling by 1 or 2 feet per year, but many are falling by 10 or 15 feet per year. These are incredibly large impacts on some of our key aquifers.

In many of these cases, the poor are affected first and hit hardest. That was one of the conclusions of the second World Water Forum, where the ministerial declaration for the first time made a clear link between water issues and poverty.

Thus water for agriculture is getting squeezed. As water moves out of agriculture, it goes to urban areas and should go there. But, groundwater sources are drying up, while the willingness to develop new resources has declined. Where does that leave us? The consequences are already visible. In Pakistan, for instance, home to the world's largest irrigation system, droughts are increasingly frequent. Our human systems are getting more and more vulnerable to what we call droughts but are, in fact, effects of overuse of water resources.

...water for agriculture is getting squeezed.

Agriculture has grown used to cheap and plentiful water in irrigated areas. Agricultural productivity has risen sharply in recent decades because of all these things we've mentioned: high-yielding varieties, fertilizers, and water use. But what will we do in the next few decades when we are unlikely to see the same willingness to invest in water resources?

Gujarat, India is a quite typical example, unfortunately. It's a state of some 50 million people with an average of about 1,100 cubic meters of water used per person per year even though it is a very water-scarce part of the country. Groundwater there is crucial for both agriculture and domestic water supply, but groundwater levels have dropped tens of meters. In recent years—two years ago and last year—there have been serious droughts. As a result, supplementary water had to be tankered in

to thousands of villages. Water has risen to the top of the political agenda, and the Chief Minister of Gujarat has asked the water experts what he should do.

Water experts tend to give answers in a rather sectoral manner. In Gujarat, four or five 2020 Vision–type documents were drawn up. One of them states that industrial water demand is expected to jump eleven-fold—eleven-fold!—in 25 years. Domestic water demand is expected to go up fourfold, and agricultural water demand, relatively modestly, to increase by only 68 percent. The increase in agricultural water demand is small, however, only if you compare it to the magnitude of other increases. The Vision documents assume that infrastructure will be built to satisfy the projected increases in demand.

That kind of solution seems to be what the water experts tell the Chief Minister in Gujarat to do. But these sectoral answers don't add up. They would result in going from the current use of about 40 percent of all the renewable resources to about 70 percent of all the renewable resources in a highly variable monsoon climate. That is practically impossible to do, and if it were possible, it would make society vulnerable to more of these so-called droughts.

Some people have pointed out that if agriculture were only to use something like 8 to 10 percent less water, then industrial and domestic demands could be met. That might seem like a strange kind of solution to some of us in agriculture, but many, many of our colleagues in the environmental community are advocating exactly that.

So what is the Chief Minister to do? He doesn't seem to have any immediate options that are politically viable and supported by a large number of the experts that advise him. And, unfortunately, Gujarat is far from alone in its dilemma. Water resources get scarcer. The poor and the vulnerable are affected first and suffer most. What are we to do?

...we have to move to looking at land and water and nutrients and genetic resources as one integrated set of scarce natural resources that all stakeholders should try to optimize and manage.

We could reformulate this question to ask how we are to find enough water to ensure food security as well as safeguard livelihoods and environmental health. But maybe we should reformulate that again and ask how we can grow the food we need with the water available. That then becomes a major challenge for agriculture—a truly global challenge.

To grow enough food and provide sustainable livelihoods to the poor with the available water will require a considerable overhaul of how we practice agriculture. The dominant philosophy is still that we try to provide enough water so that water is not a constraint. We tend to think, almost automatically, when we talk about increasing yields per area of land, that land is the only constraint. In my view, we have to move to looking at land and water and nutrients and genetic resources as one integrated set of scarce natural resources that all stakeholders should try to optimize and manage. Starting to look at water productivity, not simply efficiency, is a key part of that move.

Of course, there are a lot of different elements of this effort. At least three priorities appear if you start to look at integrated water and land resources management: (1) implementing better water and land resource management practices in agriculture, forestry, and fisheries; (2) increasing the understanding between agricultural and other water users, particularly with regard to the environment; and (3) reducing the water use, or increasing the water productivity, of agriculture—and that can take many different forms.

There are many ways in which water can be managed better, for example through improved

technology, such as laser land leveling, drip irrigation, and other high-tech methods like those used in California or Israel. These same kinds of technologies also have more human-scale, small-scale counterparts, such as bucket drip kits that are fit for small-scale farmers.

We can all agree that it would be good to improve water and land management, but how much more we should invest in increasing the extent of irrigation systems is less clear. In fact, that is a hot debate. Particularly if we think of irrigated agriculture in terms of old-style, large-scale, publicly funded and publicly managed systems, then society offers an ambiguous response about whether we should have more of that.

On the one hand, a lot of our colleagues in agriculture, particularly those in countries that would need such investments, hold it as self-evident that we have to invest in much more irrigated agriculture. Otherwise, they argue, we won't be able to obtain food security. On the other hand, in the environmental community, we have many colleagues who feel just as strongly that irrigation is already using too much water and the only sustainable solution is to reduce it.

That leaves us with strong conflicts. The conflicts over dams are only part of that larger issue. The way I have been formulating the problem is to ask the question: How much irrigation do we really need? The intonation in asking that question can change one's perspective considerably.

Some good news is that a number of organizations have said: "Yes, we come from very different directions, but we recognize that we can't just have sectoral approaches." Some 10 organizations have formed a consortium. Its members range from farmer organizations, such as the International Federation of Agricultural Producers, to the irrigation community, all the way to environmental organizations like World Wildlife Fund and the World Conservation Union (IUCN), to international organizations such as FAO and UNEP. Consortium members say we have to get together and try to bridge the gaps between sectors.

The Dialogue on Water, Food and the Environment was launched at the Stockholm Water Symposium just last month. We are happy to see that a number of donors have recognized that this is a crucial initiative and are willing to fund it. We found the first several million dollars to kick off the initiative and actually get a large number of stakeholders to focus on several issues, beginning with national and basin-level cross-sectoral dialogues. At the same time, we want to link into the local actions of NGOs and farmer organizations. Much good, new, and innovative work is done by these groups that often remains invisible at the research or national level. Finally, we want to try to link that work to a knowledge base, and therein lies considerable scope for agricultural research.

So what is the challenge for agricultural research? The challenge is partly to find a global answer to Kofi Annan's words when he addressed the Millennium Conference last year. He said we need a Blue Revolution. We've all heard about the Green Revolution and the doubly Green Revolution. Now we must have a Blue Revolution, by which Kofi Annan meant a revolution in agriculture that focuses on increasing productivity of water and agriculture—more crop per drop, you could say, although we also need more of other things per drop, including equity.

What would this actually mean? At the International Water Management Institute (IWMI), we tried to look at what it might mean. First, we put together a business-as-usual scenario and looked at the kind of increases in water productivity we might expect in coming decades. That led to scenarios where at least 12 to 17 percent more water would be required to grow the food we think we need.

So we turned the question around and asked, "What kind of water productivity increases would be required if we wanted 10 percent less water in agriculture?" We came up with increases of some 60

There are many ways to increase water productivity in agriculture that are close to the hearts of plant breeders.

percent in irrigated agriculture and some 30 percent in rainfed agriculture. That means we would need between two and three times the level of productivity increases in water we'd expect under business as usual. That is a significant challenge, but one that the international agricultural research institutes and partners could take up and say, "Okay, we could make a very significant contribution to both overcoming the constraint to food security and contributing to solving the world water crisis." To this end, we've been hearing all kinds of good ideas, from increasing the drought tolerance of corn and rice using biotechnology, to developing more salinity-tolerant crops, to increasing the water productivity of plants themselves. There are many ways to increase water productivity in agriculture that are close to the hearts of plant breeders.

We also need water management techniques. We have heard about no-till or other techniques for water and soil conservation that are quite important. We also need to do much more work related to water institutions and water pricing.

The challenge is to put these all together, to have one coherent attack on this specific problem. All these different researchers need to work together in a multidisciplinary way that forms not just interesting bits and pieces of research, but together forms a Blue Revolution that actually reaches farmers and makes a big impact on the ground.

In summary, the quantified objective of the global challenge in water and agriculture is to sustainably increase global food production by up to 40 percent. That would account for both population growth and the effort to make more food available for hungry people. And we should achieve this 40 percent increase using the renewable water resources in agriculture that we have today or, if at all possible, reducing the water used in agriculture by 10 to 20 percent.

That would make a big contribution toward solving the world water crisis. It would allow water in cities to increase. And it would protect the ecological functions that water—which we often now say flows to the sea unused—fulfills in many of the world's ecosystems.

I urge the world of agricultural research to take on this challenge to try and double the increase of water productivity in the coming decades.

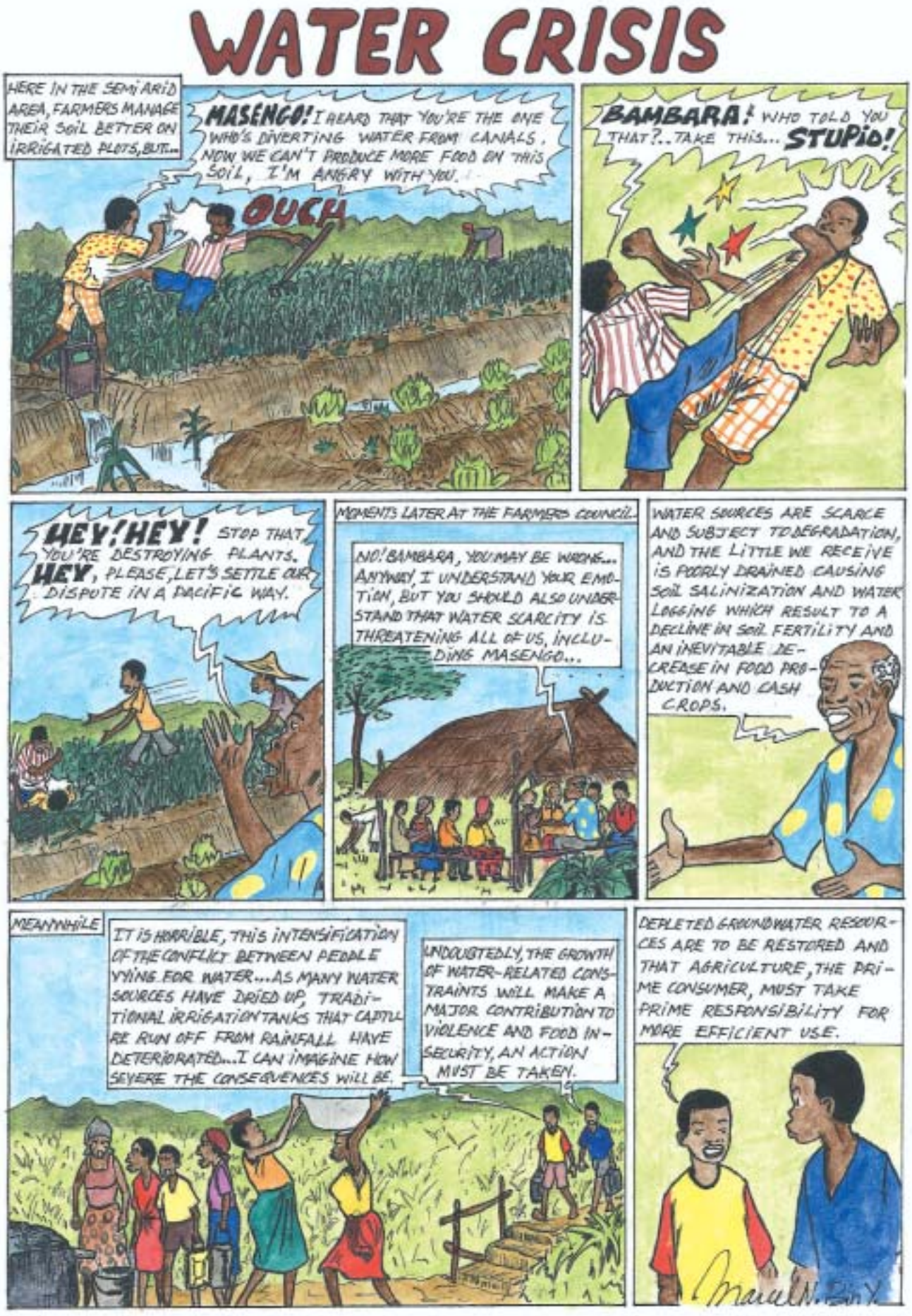
Discussion

The discussion focused on whether water conflicts are becoming a persistent, unresolved issue. Frank Rijsberman conveyed his optimism on the issue of conflicts, particularly international conflicts. Despite the fact that people have been predicting water wars, the data indicate that countries have succeeded in devising and maintaining water treaties and in cooperating, even countries that do not get along well, such as India and Pakistan. This success occurs because the benefits of international cooperation on water resources are so great. Conflict is probably less prevalent and given less attention among water users and uses within a river basin, but it is also probably more important. More capacity building is needed to help allocate water among users, particularly the users that do not have clear representatives, such as the environment.

In closing, Rijsberman highlighted the issue of rainfed agriculture. With the increase in supplemental irrigation and microirrigation, the sharp boundary between rainfed and

irrigated agriculture is disappearing. We must view the whole water cycle—green and blue water, rainfed and irrigated agriculture—in an integrated way to make necessary progress.

The Chair, Margaret Catley-Carlson, closed with a prediction that in the future, we will spend more than a half hour out of a three-day conference discussing this precious commodity.



The illustrations and text featured here are by Marcel Niyungi Bin Yungi, an artist born in Zaire and now living in Kenya. The 2020 Vision Initiative commissioned him to create comic strips depicting his perspective on key food security issues.

D. SOCIOPOLITICAL FORCES

Chapter 18

Food Insecurity—A Symptom of Poverty

Chair: Courage Quashigah

Minister of Food and Agriculture, Ghana

I must explain a situation I have been faced with given my background as a professional military officer. I've had a few problems trying to explain to my colleagues what a professional soldier is doing in the Ministry of Agriculture. However, I have learned a few lessons from the Bible. Just realize that my profession comes immediately after the profession of agriculture. In the Bible the very first profession developed by man was agriculture, and that was Cain tilling the soil and Abel raising animals. The second profession was war, and it stemmed from the conflict that arose between Cain and Abel. That tells you that if the conflict manager himself is managing agriculture, then there will be peace and prosperity.

My further reading of the Bible gives me the impression that God attaches much importance to food production. Thus in Genesis, Chapter 1, Verse 29, the first thing God showed man was food, and He said, "These herbs that bear fruit I give to you as food." That is the importance the Creator Himself attaches to food production. Now, therefore, any group that receives the mandate of a people to govern them must make this a priority, to feed the people who gave it the mandate.

All this was at the back of my mind when I took over my Ministry. I decided that my first and most important assignment is to ensure food security for the people of Ghana. I have read many definitions of food security, but I came up with my own, using simple language, to make it possible for the people of my country to understand fully. I did this, also, to help me set clear objectives that can be measured and to help me identify other agencies that must play a role in ensuring food security.

My definition of food security is: "Good quality, nutritious food, hygienically packaged and attractively presented, and available in sufficient quantities all year round and located at the right places at affordable prices."

It is this last element of affordability that links food insecurity with poverty. Poverty may be defined as the condition of a person or group of persons whose means, monetary or otherwise, do not permit them to obtain the commodities and services necessary to attain a minimum acceptable level of economic well-being. Of all the plagues that beset mankind, hunger or famine—often a direct result of poverty—is the most lethal and the one that always threatens to come back. Manna will not fall from heaven again, even if we ask the good Lord to give us this day our daily bread. Food is not there for free any longer. We have to pay for it. So we must earn money through productive work. Thus begins the vicious cycle of low productivity leading to poverty, and poverty leading to hunger, and hunger leading to lower productivity—on and on to starvation and eventually to death.

Keynote: Clare Short

MP and Secretary of State for International Development, United Kingdom

I'm sure we all agree that it must be one of the most morally repugnant features of our shrinking world, that one-half of the world is preoccupied with

dieting and worried about being overweight, and the other with the struggle to get enough to eat. I'm grateful for this opportunity to set out my thoughts on how we can ensure that everyone in the world has access to safe and nutritious food by 2020 at the latest. I believe this is a completely achievable objective. Just getting our thinking right and our determination right is the precondition for securing that aim.

The fundamental case I wish to make is that international efforts have been less effective than they might have been because we've been muddling our questions about global and national food self-sufficiency with the explanation of the suffering caused by hunger amongst one-fifth of humanity. The reality is that many people are hungry in countries that have more than enough food to feed everyone. And in many countries that are not self-sufficient in food, no one is hungry. Therefore, I want to argue that we must reconsider the way in which we measure food insecurity and the policies we adopt to deliver adequate nourishment to all.

The World Food Summit in 1996 defined food security as a situation in which "all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

This definition is helpful because it emphasizes the importance of access to food over food production. We must be clear that poverty and food insecurity are intimately linked. A review of the "Voices of the Hungry" showed that hunger is central to people's experience of poverty. In many societies poverty is defined in terms of hunger. Worries about where the next meal is coming from tend to dominate poor people's lives. Having to find food, day-by-day, is a common characteristic of poverty. Hunger is, of course, a cause of suffering, but it has much deeper effects. Hunger leads to weak immune systems that make people more vulnerable to ill health. And ill health prevents breadwinners from working and leads to expenditures on medical treatment, thus increasing poverty. And children who are malnourished experience stunting in their mental and physical development, the effects of which last throughout their lives. Thus hunger traps families into an endless cycle of poverty and passes on to the children of the poor the likelihood that their development will be damaged. Such poverty also means that the children of the poor rarely have the chance to go to school, and thus their poverty will be passed on to yet another generation.

…we must reconsider the way in which we measure food insecurity and the policies we adopt to deliver adequate nourishment to all.

When the size of the challenge became apparent, the World Food Summit secured international commitment to reducing the number of undernourished people by half by 2015. FAO suggests that progress to date has been slow. Five years later, some 800 million people, mainly women and children, remain food insecure.

This estimate contrasts remarkably with the progress that has been made towards achieving the international development target of reducing by half the proportion of the world's population living in absolute poverty by 2015. We are currently on track to achieve that target globally, though not in every country. The target was set in 1990, and by 2015, at current rates of progress, a billion people will have lifted themselves out of extreme poverty. We must ask how can these two things be true at the same time? Is it really possible that we are making progress on reducing poverty and not in reducing hunger?

One important reason for this disparity rests on how we measure progress. FAO uses the concept of "undernourishment" for measuring progress in reducing food insecurity. That sounds reasonable until we discover that "undernourishment" is largely a measure of national-level food supplies. These are calculated from data on domestic production, commercial imports, and food aid. Given the unreliability and unavailability of good statistics on development issues, I have concluded that dependence on this one indicator casts some doubt on the validity of the figures FAO uses to measure progress.

If our objective is the reduction of hunger, we need to be clear about what we're measuring in order to make progress. I suggest that we should shift our focus from measuring the national availability of food to counting the number of people who do not have the means to obtain food.

The debate on how to improve food security globally has until recently been much too closely associated with food production. Of course we must take account of our global capacity to feed the population of the world, but old ideas that focus on national self-sufficiency in food, rather than national capacity to purchase the food that is needed, are deeply outdated. And those who focus their efforts simply on increasing agricultural production must be under no illusions that they will therefore automatically help the poor to obtain food.

In fact, over recent years, global food supply has been outstripping demand. Food commodity prices are at an all-time low. World cereal production has doubled in 40 years, reducing real food prices by 50 percent. Long-term forecasts suggest that food prices will remain low, at least in the medium term.

Of course there are concerns. Demand for cereals has grown sharply. This is a result of population and economic growth, urbanization, and dietary changes, with greater demand across the world—and in the developing world particularly—for livestock produce. Demand for cereals is expected to increase further by 30 to 50 percent over the next 20 years.

Environmental change will also affect productive capacity in many countries. Substantial climate change is inevitable. Desertification, water shortages, and loss of biodiversity will undermine the productivity of large areas. All this must be acknowledged and addressed.

Nonetheless, although the overall conclusion is that global food supply is likely to keep pace with demand for the next 10 to 20 years, we cannot be complacent. Governments must continue to adopt informed policies, markets must function efficiently, and the public and private sectors must continue to invest in agricultural research and research in new technologies. We must also monitor developments across the world. But for those who focus their concern on the needs of the hungry, the conclusion is clear: world food supplies are likely to satisfy global demand for at least the next 10 to 20 years. The real challenge, for those of us focused on the levels of poverty in the world, is to ensure that poor people obtain adequate supplies of this food.

We need to be clear that most people buy food rather than produce it. Very few people, including small-scale farmers, are entirely self-sufficient in production. Food insecurity and hunger are related to poverty and an inability to purchase food. For example, hunger and malnourishment can occur in the highlands of Ethiopia even after good harvests, when at a national level, the country produces enough food for its own needs. The poor in the most badly affected areas cannot afford to buy the food and therefore fail to generate a demand for it to be transported from surplus regions. Agriculture alone does not offer a way out of poverty for most poor people in the Ethiopian highlands. Land availability per family is falling as populations grow, soils erode, and annual rainfall remains unpredictable. There is insufficient land to produce the food the people need. The symptom of poverty is hunger, but it is wrong to assume that the solution is agricultural.

In parts of northeastern India, many poor communities depend on rainfed farming for their livelihoods. They are rarely self-sufficient in food, and many migrate to the cities to provide labor when food supplies run out. My department, the Department for International Development of the United Kingdom, has supported programs that have increased yields by some 50 percent. But those increases in productivity did not adequately address the problem of seasonal food insecurity for most families. What was needed was diversification of livelihoods beyond agricultural production, so that communities had the income to purchase food for the hungry months.

Is it really possible that we are making progress on reducing poverty and not in reducing hunger?

We must be clear that the eradication of hunger and poverty are closely linked. Our strategies for poverty reduction and food security must also be closely linked. We are now in the process of developing poverty reduction strategies in all poor countries. These seek to put in place strategies to increase economic growth and improve health and education in a way that measurably reduces poverty. The lead is now local, with governments discussing their plans with local people. The development agencies are increasingly backing these plans by investing in strengthened government capacity and providing budgetary support to drive forward social and economic development. Thus, national poverty reduction strategies provide an important way of incorporating food concerns into national strategic planning processes.

Measurements of the number of food insecure people based on national-level food supplies are, at best, inaccurate and, at worst, misleading.

However, this way of working is new. All countries need to focus on increasing economic growth—for example, Sub-Saharan African countries need 7 percent economic growth between now and 2015 in order to halve the proportion of people living in poverty. But there must also be a greater effort to ensure that the increased growth benefits the poor in both rural and urban areas.

My department has been working to develop new ways of working on the needs of poor people rather than concentrating, as we have in the past, on separate sectors of the economy. The sustainable livelihoods approach is a way of thinking about the causes and effects of vulnerability and poverty, and building opportunities for poor people to improve their livelihoods in ways that make sense to them. This approach is now being used in preparing and implementing poverty reduction strategies in several countries, including Malawi, Mongolia, and Uganda. My department and its partners are using livelihood approaches in many of the poverty-reduction programs we are supporting.

What do these approaches tell us about food insecurity and poverty? First, they confirm that food insecurity and hunger afflict the urban as well as the rural poor. They also demonstrate that for many poor rural communities, the scope for improving food security through increases in household food production is very limited. The livelihood strategies of poor people are usually diverse and complex. They include, but are not confined to, agricultural improvement.

Here are a few examples. In some rural areas of Senegal the percentage of income derived from nonagricultural activities has more than doubled since 1960. One important factor is the growth of remittances from family members who have migrated to towns. In South Africa the rural poor gain more income from remittances and small-scale trading than they do from agriculture.

In Bangladesh and India, improvements in access to savings and credit schemes by poor people have helped to promote this diversification in livelihood strategies. Credit may be invested in small-scale agro-processing or other agriculture-related activities. However, credit is often used to invest in nonagricultural enterprises or for trading activities. One example that I like particularly is a community in eastern India, which used a savings and credit scheme to buy an amplifier and loudspeakers, which they hire out for weddings and parties. They know better than we do the best ways of improving their livelihoods and income levels.

This work also underlines the dangers of food aid. In situations of conflict or natural disaster it will be necessary to prevent hunger through short-term measures like food aid. But food aid should

always be a last resort and should be phased out as soon as possible. It should cease to be motivated in any way by the desire to dump agricultural surpluses in poor countries. It's time to look very seriously at the French proposal made in the recent negotiations in the Development Assistance Committee of the OECD that all food aid should be untied. A suitable target date for achieving this would be on expiry of the present Food Aid Convention in 2002. We would like to see the subject included early in those negotiations. Food should be purchased as locally as possible; otherwise, dependence on food aid undermines local markets, and in the longer term throws greater numbers of people into poverty.

Is it sensible to try and measure progress in reducing food security globally in isolation from the international development target on poverty reduction?

Measurements of the number of food insecure people based on national-level food supplies are, at best, inaccurate and, at worst, misleading. The challenge for most poor people is to earn enough money to buy food. The international development target for reducing poverty is therefore a better indicator of national and global improvements in food security.

Beyond that, we should give priority to identifying those groups for which malnourishment and hunger are leading to deepening and chronic poverty. We must focus on communities with underweight children, whose ability to develop mentally and physically is threatened. We should ask whether such households are mainly female-headed. Or are they distinct communities such as artesanal fishing communities or pastoralists whose livelihoods are under increasing strain? We should figure out where the hunger is and attend to the needs of those people, rather than coming in with our own sectoral ideas.

The Paris 21 Initiative, designed to strengthen the capacity to measure poverty and progress in reducing poverty in developing countries, provides an opportunity to make further progress. We need better indicators on the agreed development targets so that we can actually measure progress and learn from success and failure across the world. We will have measured what we're delivering and whether poor people are getting the better life that they deserve.

It is deeply shameful that hundreds of millions of people in the world are food insecure and often go to bed hungry. But let us be clear, the hunger will not be eradicated simply by increasing food production globally, nationally, or at the household level. Even in the richest countries, such as my own, there are poor people, living on the streets, often with alcohol or mental illness problems, scrabbling through waste bins for food. People such as these need attention and care. In most developing countries there are rich elites that live well, and frequently there are food exports while some go hungry. I strongly suggest that we would make greater progress if we focused on improving the lives of the poor, rather than overall agricultural production in developing countries. We must address those big questions about the capacity of the world to produce adequate food for the world, but when we're addressing them, we must not fool ourselves that we're addressing the questions of why some are malnourished and not getting enough food. We've got to address both sets of questions. For too long we have considered only overall production at a national level.

I leave you with a question. Is it sensible to try and measure progress in reducing food security globally in isolation from the international development target on poverty reduction? I suggest that we should concentrate our resources, through the Paris 21 Initiative, to help identify those groups where hunger is leading to deepening, chronic

poverty. Then we should measure progress in reducing hunger through indicators such as the proportion of children who are underweight.

When monitored regularly, such indicators enable us to gauge our progress in reducing poverty and hunger. I believe that if we focused on these indicators, we could make better progress in ensuring that by 2020 there are no malnourished children in the world.

Discussion

The discussion centered on whether the effort to achieve food security should focus on agricultural production and hunger reduction or instead on poverty reduction. It began when a participant clarified that those at the Conference were giving their attention not to agricultural production but to increasing the productivity of small-scale farmers as one powerful way to increase the incomes of people who are very poor. That is, they were focused not on agriculture per se, but on agriculture as a means to end hunger.

The participant added that the IFPRI data on hunger are based primarily on child malnutrition and asked that the FAO data system be improved to incorporate the child nutrition data. He also asked whether the discrepancy between poverty data, which suggest that the world is on track to cut hunger in half by 2015, and hunger data, which suggest that it is not on track, could be explained by the fact that the poverty goal was set in 1990 and the hunger goal in 1996. Therefore, the hunger goal missed six years of tremendous prosperity.

Although Clare Short agreed that it is important and desirable to increase production by small-scale farmers, she noted that the heavy focus on food production—small-scale food production and poor rural communities' food production—has meant that policies have not addressed the land that was urbanized. Short reiterated that she was questioning the figures that the FAO system uses. It is significant, she said, that the world has set a target on nourishment, which is a core component of anyone's sense of poverty, and that the data show slow progress despite heightened international consensus about how to work together to achieve better progress. One set of figures shows systematic poverty reduction, and a different set of figures shows progress in hunger reduction. We must examine the difference between the two for the purpose of formulating better policy. The very marginalized poor are not getting into the equation under current methods of measuring food self-sufficiency; capturing the malnutrition of children is a means of getting the poor into that equation. To make more progress, it is important to refine what is being measured and what targets are being set.

In closing, the Chair, Honorable Minister Courage Quashigah, added two points. First, a holistic view of food security requires looking at the large postharvest losses that characterize the agricultural sector of developing countries, mainly due to the lack of processing and storage facilities. Second, high production areas are often inaccessible; produced food needs to be brought out to the consuming areas.

Chapter 19

Empowering Low-Income Women

Chair: Agnes Quisumbing

Senior Research Fellow, International Food Policy Research Institute

The subject here is empowering low-income women. You may ask, "What does empowering low-income women have to do with food security?" We have considered a whole range of issues about food security, from increasing agricultural productivity, to reducing poverty, reducing malnutrition, and looking to the future by investing in the next generation. Empowering low-income women is a critical ingredient in all of this. IFPRI's research on gender issues shows that women are important as food producers, managers of natural resources, income earners, and caretakers of household food security.

Some key findings from IFPRI's gender research program put this in context. First, agricultural productivity increases as much as 20 percent when women are given the same inputs as men. For example, in Burkina Faso, where more labor and fertilizer are applied on men's plots, women's yields are lower. But household agricultural output can be increased as much as 20 percent by reallocating inputs from men's to women's plots.

Second, increasing women's human capital is central to poverty reduction. In Mozambique, increasing the level of female education reduces poverty by a quarter. It is the largest contributor to poverty decline, even larger than male education.

Third, increases in women's education and status within the household contributed more than half of the reduction in child underweight rates in 90 percent of the developing country population between 1970 and 1995. Improvements in food availability contribute only a quarter to the reduction.

And, finally, increasing women's control over assets raises investments in the next generation, especially in education and girls' health. New evidence from Bangladesh, Ethiopia, Indonesia, and South Africa shows that women have fewer assets, but those assets have a greater effect on household decisions on investments in the next generation. More assets in women's hands lead to more expenditures on education. In Bangladesh, that leads to better health and education outcomes for girls.

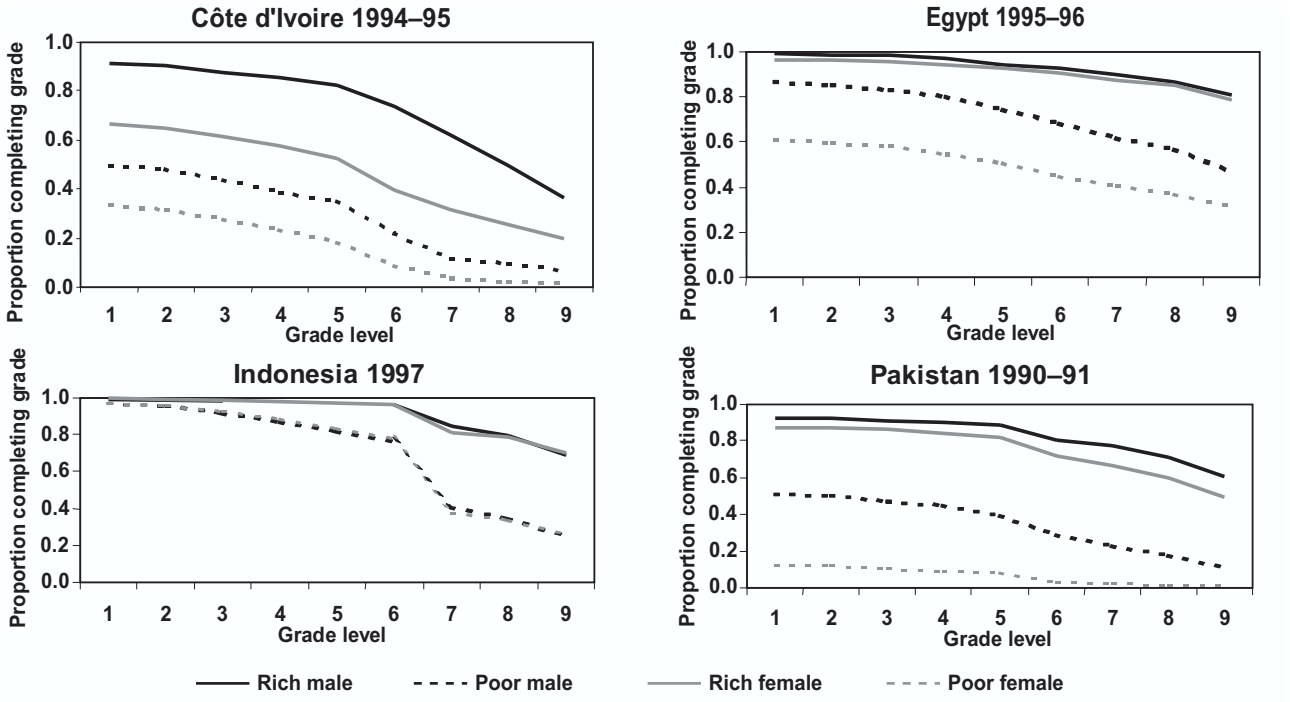
Yet there is still much to be done. There have been great strides in increasing opportunities to invest and make use of human capital, but there are still large disparities in women's access to natural and physical capital. Legal and institutional frameworks still need to be strengthened to give women the right to command more resources.

There is a ray of hope in all this, many rays of hope. National governments, international organizations, and civil society have experimented with various ways to empower low-income women to achieve food security. We know that empowering low-income women is important. How do we go about it?

Education:
Elizabeth King

Lead Economist, World Bank

I would like to begin with the basic premise that educating girls is a development goal at least as



Source: Deon Filmer. 1999. "The Structure of Social Disparities in Education: Gender and Wealth," *Policy Research Report on Gender and Development Working Paper Series No. 5.* The World Bank, Washington, D.C.

FIGURE 1

important as educating boys. Education is a key ingredient for women to have greater control over their lives and over the quality of life of their families.

While many studies worldwide have documented the importance of women's education for its impact on child schooling, nutrition, and a lot of other good things, educating girls is also important for women themselves. Those who lack access to basic education are likely to be excluded from new opportunities. And where longstanding gender gaps in education persist, women will be at an increasing risk of falling behind men in their ability to participate in development and also to benefit from development.

Educating girls is strategic for achieving development. And I would argue that it is at least as important for achieving many of the desired goals that we have been talking about in these last two days. I would like to talk about three things. The first is the nature of the problem. Many of us think that educating girls is no longer a problem, that we know what to do, that we've achieved progress and it's time to move on to other topics. My point is that it's easy to stumble, it's easy to erode a lot of the gains that we've seen in the past. Second, I want to reiterate some of the points already made about why educating girls and women is important. Third, we need to ask, What can be done? What have we learned from more recent experiences on this topic?

We've seen gains all over the world in enrollment rates, certainly at the primary level but also at the secondary level. We've also seen a greater equality between boys and girls in many regions of the world, but progress is uneven and slow. Probably the most important thing to point out is that we may not have to worry about boys and girls in the richest income groups (see Figure 1). This problem is a problem of the poor. It is really among the poorest income groups where we have to talk about the gender gap in education.

Many high-income households in poor countries are very much like high-income households in

In Africa, if men and women had equal schooling, child mortality would have been 25 percent lower in 1990.

the rich countries. But the poor-income households in poor countries are quite different from the high-income households in the same countries. They're like a whole country apart, so we cannot talk about educating girls without talking about the poor.

Girls and women bear the cost of gender inequality in education. They have less control over the quality of their lives, are less able to participate in development, and are less able to benefit from the good things coming from development. But societies that discriminate on the basis of gender pay a significant price also in terms of higher poverty, lower quality of life, slower economic growth, and weaker governance. I want to talk about a few of these things today.

...those countries whose urban areas have the largest literacy gap between men and women tend to be the countries where HIV infection rates are higher.

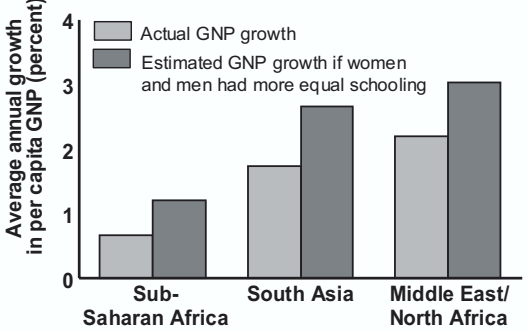
First, the future generation benefits from greater gender equality. In Africa, if men and women had equal schooling, child mortality would have been 25 percent lower in 1990. In Brazil, income in the hands of mothers has four times the impact on children's height-for-age as income in the hands of fathers, because mothers spend on different things than fathers do. We know that extra income for the household can have good benefits for the family, but who controls that income makes a difference. Whether women can control that income or not is closely linked to whether they themselves can earn and, therefore, whether they have the education that increases their ability to have command over resources.

Second, in India, children of literate mothers spend two more hours per day studying than children of illiterate mothers, telling us a little bit about the effectiveness of investments we make in education. If we do not have the support in the family, public investments in education are less effective.

Third, if women and men had more equal schooling, incomes—and the economy—would grow faster. When only half of the labor force is able to read and write, to obtain credit, to develop a work skill, to obtain work, it is hardly surprising that there will be losses in output. Systematically excluding parts of the labor force from access to factors of production will show up in the level of growth in economic production. One study shows that if countries in South Asia, Sub-Saharan Africa, and the Middle East/North Africa had a smaller gender gap in average years of schooling—in particular, if in 1960 they had the gap that the East Asian countries had on average—and if that gender gap in education had narrowed over a 30-year period as it did in East Asia, then Sub-Saharan Africa, for example, would have grown at almost double the rate that it grew during that period (see Figure 2).

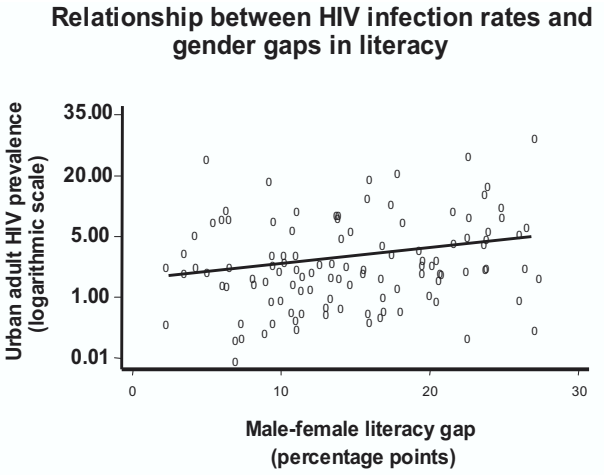
Another example of the cost of gender inequality in education pertains to the AIDS pandemic. AIDS will spread rapidly over the next decade until one in four women and one in five men are affected, which is already the case in much of Sub-Saharan Africa. Whether or not women themselves contract the disease, they bear the responsibility for care in their

Impact of women's education on GNP growth, 1960–92



Source: Stephen Klasen. 1999. "Does Gender Inequality Reduce Growth and Development? Evidence from Cross-Country Regressions," *Policy Research Report on Gender and Development Working Paper* Series No. 7. The World Bank, Washington, D.C.

FIGURE 2



Source: Mead Over. 1998. "The Effects of Societal Variables on Urban Rates of HIV Infection in Developing Countries: An Explanatory Analysis," *Confronting AIDS: Public priorities in a global epidemic*. The World Bank, Washington, D.C.

Note: The vertical axis measuring HIV infection has been transformed to a logarithmic scale. Points on a given scatter plot represent the data for individual countries after removing the effects of the other seven variables included in the regression analysis. Income inequality is measured by the Gini coefficient. On average, the passage of 1.6 years is associated with an increase of about one logit, or about 4.3 percentage points in the prevalence rate of low-risk urban adults.

FIGURE 3

family, both for their children and for those afflicted with the disease.

Countries continue to look for ways to stop the epidemic and to reduce its impact on adults and the next generation. A cross-country study of 72 countries indicates that those countries whose urban areas have the largest literacy gap between men and women tend to be the countries where HIV infection rates are higher (see Figure 3). Why is that? Perhaps this evidence tells us that women with more schooling are better able to protect themselves in their sexual relationships, and better able to ask their husbands and partners to protect themselves from sexually transmitted diseases. So, again, part of the story is about women's empowerment and control over their lives. Gender disparities persist for many reasons:

One, societal institutions are based on norms, customs, laws, and markets; inequalities exist in these different institutions. These institutions shape roles and relationships between women and men, and influence their access to resources and the activities they're allowed to undertake. Markets create incentives that encourage or discourage prejudice.

Two, household decisionmaking does not occur in a vacuum but is influenced by these incentives established by societal institutions. But ultimately households and individuals make the decisions. We need to affect behavior at that level.

Three, economic policies affect the level of household income, the distribution of income among household members, and relative prices—all of which in turn affect gender relations and gender outcomes within the home and within society at large. We tend to think about economic policies as gender neutral, but in most cases they are not. Because of norms, because of the unequal distribution of resources between men and women, economic policies that are supposed to be gender neutral are not gender neutral. Failure to recognize this compromises the effectiveness of policies.

I suggest three strategies. The first two strategies, economic growth and reforming institutions, come from the factors I just talked about. These are long-term strategies for increasing girls' and women's education.

Let me say more about a third strategy: active measures to redress persistent disparities. The active measures can act upon three things: (1) pricing policy; (2) the physical accessibility of schools, and the service, quality, and attributes of schools; and (3) targeting.

The good news is that demand for girls' schooling is more sensitive to changes in prices than demand for boys' schooling. Thus, if we can come up with pricing policies that can raise schooling, especially for the poor, they will have a bigger impact on girls. Price elasticities of demand for girls' schooling is 12 to 21 percent higher for girls than for boys, so that interventions that reduce costs will have a bigger effect on girls' than on boys' schooling. We know this from program evaluations of a stipend program in Bangladesh, a subsidy for girls in Balochistan, Pakistan, and a national school voucher program in Colombia that has a larger effect on girls than on boys.

Design also matters for gender equality in schooling. The lessons from program evaluations imply that staffing schools with female teachers in Bangladesh and Pakistan has made a big difference. Providing some privacy to girls within the school and improving the quality of instruction are very important. Because the demand for schooling for girls is rather vulnerable, rather unstable in many cases—fragile, if you will—improving the quality of instruction, improving the quality of schools may make a much bigger difference for girls staying in school than for boys staying in school.

Finally, investments in rural infrastructure make a difference because girls and women spend a large amount of time in collection activities, for both water and fuel. In Sub-Saharan Africa, as much as half of a standard work year can be saved by bringing water sources and fuel sources within half an hour closer to households.

In summary, we've talked about girls' education as a strategic investment in development. It is a very important development goal. But we should also realize that achieving this development goal—thus empowering women and increasing their control over their lives and their future—is closely linked to the effectiveness of many other development strategies that we can talk about.

Agricultural Programs: Wilberforce Kisamba-Mugerwa

Minister of Agriculture, Animal Industry and Fisheries, Republic of Uganda*

I was asked to speak about the redesigning of agricultural programs to meet the needs of women farmers. The programs cannot be redesigned without knowing the problems faced by women farmers, and the importance of women in fighting the current food crisis cannot be underestimated.

In Uganda, women account for 80 percent of the total labor force in agricultural production, and they contribute 78 percent of food production. Despite their large role, they use poor technologies. So in discussing women's problems in agricultural production, we must focus on their needs. The needs of women farmers revolve around their strategic and practical agenda, which demand both long-term and short-term solutions for improving their performance in farming. If we are to make any change, we need to focus on women farmers.

In examining agricultural policies and programs, we need to address issues related to women's low status. Women's low status is evident in their minimal access to resources like inputs, land, and credit and the fact that they have low income and low literacy. They have a low status in society even though they contribute heavily to feeding their families.

When we design any agricultural project, program, or scheme, we must emphasize partnership with and involvement of women. The mistake we generally make is to think that we can design a program in Bonn or in Kampala for women in rural areas. We need a bottom-up, participatory approach to designing these programs in order to respond to the needs of women farmers. That is, women must be involved right from the designing of that program. There is a tendency for planners and policymakers to think that rural women farmers don't know their own problems. Yet such women can clearly articulate their problems based on their own experience in farming. So the need to involve women in designing, implementing, and monitoring agricultural programs is crucial.

In Uganda, when the Plan for Modernization of Agriculture was being designed, we considered gender issues to be crosscutting ones. So whenever we talk of any agricultural development program, gender issues are taken into account. A multisector approach was adopted in designing the Plan for Modernization of Agriculture and it involved all stakeholders, including women at the grassroots level.

When developing agricultural technologies to improve women's farming productivity

...the need to involve women in designing, implementing, and monitoring agricultural programs is crucial.

* Summary note included in Appendix 3.

and livelihoods, it is essential to ensure that the technologies generated are affordable. Technologies must be cost-effective and suitable for women farmers to adopt them. In Uganda women generally are involved in the process of developing technologies to suit their needs.

Women also need leisure. They need to talk with their husbands and friends and watch television. The problem is that they are kept busy throughout the day. We need agricultural technologies that also relieve women of time-consuming farm tasks so they have time for leisure or for generating income.

Women need seeds that have specific characteristics when grown. In Uganda a high-yielding breed of beans was developed and the scientists thought that they had hit the jackpot. But women never accepted the beans simply because they had very soft stems. Women said that these beans follow them. By following them, they meant that when one walks through the field the stems easily bend on the ground. The stalks are so weak that they easily bend in any direction, and the women didn't like it.

These sound like small things, but they must be taken into account. Is the technology appropriate? Is it affordable? Is it accessible in terms of cost and distribution? Is it labor-saving so that women farmers have time to attend to other demands in the field? Is it yield-enhancing so that the technology can increase productivity and production? If it is a seed, is the crop grown from it palatable? Is it environmentally friendly? All these issues must be taken into account. It is paramount to reconsider the technology needs among women farmers for production, processing, and postharvest handling of food crops.

As we are talking about technologies and women's needs, we cannot ignore a new phenomenon that has emerged, due to HIV/AIDS. When designing agricultural programs we need to minimize farming systems that encourage the migration of the labor force, leaving women farmers alone at home. This enhances the spread of HIV/AIDS, which hurts women farmers.

AIDS has created a new feature in the structure of the labor force. The labor force is declining because when AIDS hits the husband, it eventually hits the woman as well, leaving the family impoverished. It is not uncommon to find small girls taking care of families. In Uganda, it is common to find a family headed by a 17-year-old girl looking after five children. So this new phenomenon must be taken into account when we are designing programs, projects, and schemes related to agricultural production.

Then, there is a need to improve access to market information that will enrich women farmers' knowledge of meaningful enterprises. They need to know about other income-generating opportunities. In Uganda, the NGOs working in rural areas have access to the Internet, while the farmers for whom they work in the rural areas, who are mostly women, don't have access to a computer and are computer illiterate. There is a need to enhance women's knowledge about the use of information and communication technologies to get badly needed information. The same applies to people in charge of extension and production, who also lack access to computers.

So we need to see how we can enhance the use of information and communication technologies. In agriculture, we have not exploited this to the maximum. The information generated has not reached the recipient. In some cases we have generated wrong technologies, but even the right ones are inaccessible to women farmers. We need to exploit this age of information and communication technologies by disseminating technology that will increase productivity and ease the marketing process, for women farmers in particular.

Once we target women farmers, we will find it easy to promote agricultural productivity. To do so we need gender-disaggregated statistics. Whenever we go into an area for study, we tend to approach the men, who generally think that they own the farms and yet are not the decisionmakers. They do not feed their families. It is important that we target the women. But we cannot target them unless we

A group of students poses with Conference organizers before entering the session on "Empowering Low-Income Women."

have the proper statistics. However, most government data in developing countries are not disaggregated. You may well not know how many women are illiterate, how many are of what age, what they are suffering from, and which ones go hungry. So we need disaggregated statistics in agriculture, and rural development needs to empower women through gender targeting.

In Uganda we are working on these tasks through agricultural extension services, for which we encourage women to become service providers so they can easily access fellow women.

In Uganda the National Constitution enshrines the need to empower women. It encourages the involvement of women by stipulating that at least one-third of the total people required in any elective undertaking be women. Women are given equal opportunities to participate in political representation and they benefit from affirmative action.

Rural women's groups and associations need to be strengthened so that they have a joint voice. It is easiest to reach women when they are in groups.

In summary, there is need for an intensive effort in and emphasis on mainstreaming gender in the design of agricultural programs intended to improve the welfare of women farmers. It is important to ensure that whatever agricultural program is designed we consider how it affects women, its appropriateness, and its cost-effectiveness for women. The issue of affordability and accessibility are important. They give us a strong point of entry to any decision in designing agricultural programs suitable for women. We must recognize women as decisionmakers and agents of change on issues related to food security and household income generation.

Property Rights: Ruth Meinzen-Dick

Senior Research Fellow, International Food Policy Research Institute

We know that control over assets plays a major role in economic production and in providing security to people—assets like land, water, trees, livestock, and houses. But we also know that property rights over these assets are distributed unequally. In fact, lack of control over assets is often the defining characteristic of poverty. Rights are not distributed equally between households within a community or even between men and women within a household. Even where women are the main ones responsible for providing food for their families, rights to land and the related assets with which to grow that food mostly belong to men.

Why do property rights for women matter? First of all, property rights can contribute to higher agricultural productivity in many, many ways. Credit and extension services are targeted at landowners and usually bypass tenants or women who don't own their land. Property rights provide an incentive to invest in the improvement of resources because you get the assurance that if you make the investment, you'll get the returns. In fact, without property rights, you may not have the authority to make an investment even if you want to. For example, in many parts of the world, women are prohibited from planting trees because that's seen as staking too strong a claim on their household land.

Property rights provide a say in decisionmaking regarding a resource, which can

Women without independent property rights can lose everything if they're widowed or divorced.

help ensure that the resource is used in a way that meets women's needs. For example, if women don't have any rights to forestland, they may be excluded from decision-making on how the forest is used. And so they may not be allowed to even collect downed kindling for fire. Property rights convey status and respect, both within the community and within the household.

...it isn't enough for women to have property rights over land, water, trees, or other assets unless there are services to make those assets productive.

Property rights are one of the most important sources of security. Women without independent property rights can lose everything if they're widowed or divorced. This issue is becoming increasingly important with the AIDS pandemic as large, increasing numbers of widows are losing their asset base. Finally, property rights improve women's bargaining power. Studies have shown that if the mother has control over assets, there's likely to be higher investment in the children, especially in girls. That helps empower the next generation as well.

If we accept that it's important to strengthen the property rights of low-income women, the next question is how this can be done. Here are some promising approaches.

Changing laws seems to be one of the most straightforward ways to strengthen women's rights over land and other resources as well. For example, changes to laws on inheritance, widowhood, or divorce can reduce discrimination against women. Even implementing certain administrative rules, like requiring joint titling of land in the name of the husband and wife rather than just in the husband's name, can play an important role. However, just changing the laws in the capital city won't necessarily make a difference in the lives of poor women. Measures are also needed to make sure women are aware of the reforms and can take advantage of them. Legal literacy and public awareness campaigns can play a major role in this. It also helps women take advantage of the new laws if public opinion can be swayed to support them. Finally, administrators who carry out land policy need to be supportive of poor women. Women often don't have as much education or mobility as men do, so it is harder for them to come to register or defend their claims. Special efforts may be needed to make government programs accessible to women. Rather than thinking of l egal reforms as something that happens in the capital city or in a parliament, we need truly grassroots outreach.

Land reforms have transferred property rights to poor people in many parts of the world. However, the record on strengthening poor women's property rights is not as strong. Often the land is registered only in the man's name. In some cases, land reforms have taken land over which women had use rights based on local custom and given ownership of that land to men. Again, as with legal reforms, there is a need for both policy and implementation that seek to transfer property rights to women.

Many land reforms focus on large agricultural holdings with the idea that transferring small plots just isn't worthwhile or would lock people into poverty. However, even small homestead plots can be very important, especially to women. They provide security against eviction, the status and pride of owning your own home, and also the chance to grow vegetables and fruits and high-value horticulture for their families' nutritional requirements or for sale.

Many governments are engaged in devolution programs that transfer rights and management of forests, rangelands, and irrigation or water supply systems to local user groups. These policies strengthen control rights over those resources for members of the

groups. But who are these group members? Do both men and women participate in decisionmaking?

A recent study in Kenya found that groups with both men and women taking an active part actually function better than either all-male or all-female groups because they draw on the complementary strengths of men and women. In many countries, though, where women are not educated or have not been included in public decisionmaking, they may not be comfortable or able to really participate. Thus women need to be explicitly included in the user groups, and investment is needed to strengthen women's ability to speak and be listened to.

In recent years, there has been increasing interest in group-based projects for women, such as the Grameen Bank microfinance projects. In many cases such projects have strengthened women's control over assets by making it possible for them to save or get credit to buy the assets. But we also have to look at who controls the asset after it has been purchased. Does the woman still control it or does it get appropriated so that she incurs the debt but the man gets the asset?

Group-based livestock projects also transfer animals and knowledge about how to raise them to one woman in a group who then passes the knowledge on to the other members. In many cases, the social networks that develop through these kinds of group-based projects are themselves an important, even an essential, social capital asset that empowers women. That means women's groups may be individually small but add up collectively to a powerful force.

Of course, it isn't enough for women to have property rights over land, water, trees, or other assets unless there are services to make those assets productive. Services can include roads, transport, access to market, and communications. Then technology designed for women to relieve their workloads or to create higher-value products; extension and training that reaches women; and education for better use of those assets are also needed.

One example of a farmer-based research and extension group shows a lot of these features. The group processes seed, making high-quality seed available in the area. But, more important, the women participate in the process of research and extension and dissemination of their findings. That process of developing and sharing the technology and the resource practices builds confidence and empowers women, and helps ensure that technology meets their needs.

Stronger property rights can do much to empower low-income women, but the need goes beyond property rights laws. Just as important are public perceptions of what is right and just, creative programs to strengthen women's control over assets and to build new assets, and investment in women themselves as actors and partners in the development process.

Empowering low-income women is essential for themselves, for their families, and for sustainable food security.

Discussion

The discussion on empowering low-income women was rich and multifaceted. Key topics were the inclusion of men in gender issues, the role of the women's movement, and measuring the impact of women's programs. Participants brought up several aspects of education and made comments on property rights, support services, time- and labor-saving initiatives, political empowerment, and the effects of HIV/AIDS.

A primary focus of the discussion was the gender question. A participant initiated the discussion by noting that there is a need to look not at women in isolation, but rather at how women and men relate to each other. How do we bring men into agriculture? How are the attitudes and support mechanisms of men for women coming together? This participant shared experiences with Heifer Project in Uganda, noting that projects with dairy cattle are especially productive for women in terms of food and income but that the men appropriate the income. So women still have no income to purchase things on their own. Moreover, the level of violence has not changed. Women's status does not change unless we also address men's attitudes, and that does not happen automatically with income generation. It involves public perceptions and deliberate discussions. How can we more deliberately raise those questions of attitude so that men and women work as partners to build on the successes of the women's movement?

A participant asked Honorable Minister Kisamba-Mugerwa the following: if 80 percent of the workforce in Uganda are women, as he indicated in his presentation, what do the men do all day while the women are working? It is not uncommon, Kisamba-Mugerwa responded, to see a woman in Uganda harvesting groundnuts and taking the carriage to the market. On her return, the woman has bought all the food and the man is walking behind, staggering and drunk. He lamented that it will take generations before the men can do the laundry or prepare the meals. It is still the responsibility of women to feed the family.

In response to one participant's call for bringing the men into agriculture in Sub-Saharan Africa, another participant pointed out that men have migrated to the towns to enter a job lottery, which, if successful, is very rewarding for the family but which is often unsuccessful. So men are forced to stay in low-value, informal-sector work, and that is a very unsatisfactory equilibrium. The reason for this situation is the extremely unproductive nature of agriculture, to which women, having lower status, are condemned by the societies in which they live. The solution is surely scientific, productive, and labor-intensive agriculture in smallholdings, but agriculture that is increasingly intensive in skilled labor so that educated women will be, as they are in many countries of the world, proud and happy with the high incomes that these smallholdings can bring. With the yields now achievable in much of African agriculture, however, this goal is difficult to attain.

The women's movement was another key topic of discussion. One person pointed out that the women's movement, which was not mentioned during the presentations, plays a major role in bringing agendas to the forefront, pushing for reforms, and changing attitudes and mindsets, thereby helping make programs sustainable. The women's movement has pushed for legal reforms and brought attention to violence against women. Women in the Third World have realized that they have to negotiate, to lobby, to advocate, and to engage in activism. A participant pointed to the positive influence of globalization, as global initiatives have given local women the energy and courage to tackle deep-rooted traditional

taboos. Ruth Meinzen-Dick agreed that the women's movement has become truly global; developing-country women are involved in it as much as are the developed-country women. Elizabeth King added that it is not necessarily only organized women who have helped achieve progress. A recent newspaper story described how women in one village in Turkey decided to keep the men out of the bedroom until the men had organized to put water wells closer to homes. In that example women were not necessarily preorganized, but they got together to make a point, which is that infrastructure in their village needed to be changed so that women did not spend so much of their time fetching water.

A third key point during the discussion was the measurement of impact of women's programs. A participant indicated that the impact of programs on women is less direct than many of the indicators currently used show. A positive impact on women will lead to a positive impact on their families, on the next generation, and on education. What is needed, and perhaps IFPRI could be helpful in this, is a way of measuring the impact that programs have on women, such as the number of female children that end up going to school and the empowerment and other social effects that are difficult to measure. Because the impact of these programs on women is frequently missed, funding for them is often not available. Meinzen-Dick responded that it is difficult to measure empowerment quantitatively, and a quick survey might not necessarily reveal the impacts of a program. IFPRI's work on the impact of agricultural research in Bangladesh, in particular on a program that targeted women for improved vegetable varieties, has shown that although the nutrition and incomes of the households were not necessarily higher, the women were sharing the surplus with their neighbors, which was a valuable form of social capital. In addition, the women felt more comfortable and empowered in dealing with the vegetable traders. Although these results are difficult to measure, they are not unimportant, and efforts should be made to identify them. King reiterated the importance of program evaluation as a means to pass on lessons learned to policymakers and next generations. She noted that in education it is common to begin pilot projects but not assess them or evaluate them in order to tell others exactly what steps are needed. Countries have only limited financial and administrative resources, and program evaluation actually leads to more effective use of these scarce resources.

Participants raised several issues related to education. Education goes beyond schooling, commented a participant, and it is important to educate women to be able to take on decisionmaking positions or to tackle the HIV/AIDS epidemic. When a participant brought up the dilemma of educated rural women leaving agriculture for off-farm employment opportunities, leaving less-educated women working in agriculture, King replied that if agriculture proves to be productive enough and if their education makes a difference, women will stay in agriculture. If their education does not make a difference, women will leave agriculture, just as men do when they have more education. Why keep women uneducated so they will not leave agriculture? A third comment from the audience

on education raised the need to focus empowerment measures on young farmers, both girls and boys. They need to learn what the WTO and structural adjustment programs mean for their future. Young farmers are the breadwinners of tomorrow and will play a key role in ensuring food security. A participant added that primary education is not yet universal. It is crucial to promote girls' education to help reach the long-term goal of providing skills to women.

A variety of topics on women's rights were discussed. Equal property rights are important for men and women in rural areas, a mechanism is needed to enforce them, for even if equal property rights exist, men can deprive women of that right. Even if women have a piece of paper ensuring their property rights, they may still see nothing. Meinzen-Dick pointed out that a woman needs control over property rights to ensure that she has control over the resource when the man is not present. Public opinion, legal literacy, and support services need to be shaped to enforce women's property rights. For example, a commercial film in Zimbabwe depicted a woman defending her rights to land in court. These kinds of messages are important. Customary rights will continue to be important, and rights derived from a lot of sources will continue to interact.

Kisamba-Mugerwa said that Uganda has taken affirmative action in educating women at universities, in allowing women to participate in politics, and in universal primary education. Legal reforms are still needed to increase women's access to land, coownership, equal education, equal payment, and many other rights. Since women are the main contributors to food security, they need better access to inputs, land, and information to increase productivity and household income. In generating technology, be sure that it is labor saving and does not burden women. If a microfinance scheme is designed, be sure that women have access to it.

A participant remarked that vocational training institutions are encouraging women to participate, but these women cannot perform as well as their male counterparts because they are carrying babies on their backs and governments do not supply support services. The woman may be listening to the theory behind mixed farming, but she is concentrating on her baby. What are we doing about support services like child care, and what do our gender policies actually say about support services? Meinzen-Dick added a question: Where are the meetings for these events held? If they are held in a place where women cannot go, such as a bar, then there is a barrier, whether informal or formal. Offering child care so that women can attend training is important. It raises costs in the short term but can have important payoffs even for the next generation.

A participant added to Elizabeth King's comments about time- and labor-saving initiatives. Food markets should be located close to communities so women do not have to travel so far to purchase food. Standardized weights and measures should be introduced to prevent women from wasting time bargaining for food and moving from one point to another

trying to find the cheapest food. Another suggested measure was to add value to local food products so women do not have to spend the entire day preparing food for cooking. In Africa, for instance, a woman buys yams, plantains, cassavas, and cocoa yams all in their primitive form with no value added. The woman must spend a lot of time peeling, cutting, and washing before cooking them.

On the issue of political empowerment, a participant pointed out that developing countries have been moving much more quickly than their developed-country counterparts in empowering women politically, which could indicate that the rate of increase in women's rights will be faster in the near future for women in developing countries. Meinzen-Dick agreed that the United States has much to learn in terms of women in leadership positions. King said that the proportion of women in national decisionmaking positions over the last 30 years in different regions of the world does not surpass an average of 10 percent. In thinking about putting women in decisionmaking positions, it is important to think about the household, the community, and the national bodies.

Another question concerned the effects of HIV/AIDS on women. The death rate among women from AIDS is much higher than the death rate of men. A study in four countries in the mid-1990s showed twice as many women, proportionately, dying of AIDS as men. What implication does the resulting huge gender imbalance have in the medium term for the gender problem in Sub-Saharan Africa? King replied that health policies and interventions need to take into account the gender imbalance of the HIV/AIDS epidemic. Increasing work opportunities for women can help make them less vulnerable to activities that increase their exposure to HIV/AIDS. The effect of a skewed sex ratio at birth is another factor. In some countries, a shortage of females at birth can encourage higher rates of commercial sex activities 10 to 20 years later and therefore increase the HIV prevalence rates.

Several other comments were made during the discussion. In talking about women's rights and attitudes toward women, said one participant, there is a need to talk about how to abolish female circumcision. Another issue raised was the positive role of food aid for women. Much research has been done, including work by IFPRI, on food aid as an incentive for increasing women's participation in food production and as an incentive for education. Even given the previous discussions about the limits and weaknesses of food aid, it is essential to work on making the best use of this tool. Another participant raised a question about increasing women's control over assets and the difficult question of conditionality. Should a specific level of asset reform be accomplished or the project stopped?

In closing the session, the Chair, Agnes Quisumbing, added that the struggle is far from over. We still need far-reaching changes in our cultures and in legal and social institutions. We need to be innovative in designing programs and honestly evaluating them, because the potential impact, if they are designed properly, is great. Finally, a solution to any women's issue must involve men. The gender issue is everybody's problem.

WOMEN

The illustrations and text featured here are by Marcel Niyungi Bin Yungi, an artist born in Zaire and now living in Kenya. The 2020 Vision Initiative commissioned him to create comic strips depicting his perspective on key food security issues.

Chapter 20

Governance and Food Security: Acting in the Public Interest?

Chair: Solita Monsod
Former Minister of Economic Planning of the Philippines and Chair of the Philippine Human Development Network

The role of good governance in achieving sustainable food security for all has been underlined again and again. Pro-poor economic growth, empowerment of the poor, and effective provision of public goods are the backbone of any successful attempt to achieve sustainable food security for all. Internal weaknesses and external factors have resulted in the failure to realize a sustainable increase in food production, adverting to both national and global governance. Good governance, at both the national and international levels, is central to growth, poverty alleviation, and food security. Governance is clearly a cross-cutting theme.

I only wish that good governance were as well defined as food security. It actually gets very fuzzy treatment. For example, we talk about the need for policies ensuring good governance, transparency, and the rule of law almost as if each was separate from the other, and then about policies providing adequate safety nets, again, as if these were not part of good governance.

Good governance should be considered much more broadly and include within it the rule of law, transparency, lack of corruption, conflict prevention and resolution, sound public administration, and respect for human rights. However, there seems to be a difference between what it entails at the national level and at the global level. Bilaterals and multilaterals alike never tire of repeating transparency, accountability, participatory democracy, as if they were the mantra when talking about the need for good governance in developing countries. And yet, also important are accountability and participation in the management of the global economy.

We may not have a de jure global government, but we certainly have a de facto one: a G-7, a G-8, sometimes a G-1, who makes the rules with absolutely no transparency, no accountability, no participation, and who seems loath to provide or perhaps is incapable of providing the global public goods or regulatory frameworks that are needed because of market failures.

In any case, the critical role of governance affords us a tremendous window of opportunity to achieve our goals. That is really the good news because, as an emerging sociopolitical force, organized civil society is in a position to influence the government decisions or public choices that are made. Public choice theory is normally quite depressing. It essentially says that major players who influence government decisions—the politicians, civil society (that is, voters), business lobby groups, government bureaucrats, media—basically are not interested in maximizing the social welfare function. It follows that the decisions made are seldom in pursuit of the collective interest, and that explains the preference for market decisions rather than government decisions. The assumption is that market failures are less costly than government failures.

The emerging sociopolitical forces are really an alliance or network of different sectors of civil society—NGOs, academia, media—that can effec-

tively do the kind of lobbying that is the traditional ambit of the business sector. Thus they can exert influence on the politicians not only during elections but in between.

This kind of activity has been undertaken quite successfully. We have the capacity to win the necessary political commitments. So we should agree on political strategies and then follow up with serious and coordinated political organizing. We need to become more activist with policymakers and the public, and, of course, we must be backed by rigorous research findings. This is the kind of activity that influences or informs the so-called political will, which is so necessary to undertake reform or change.

The power that we can harness brings with it an equivalent responsibility, a commitment to a course that directly benefits others rather than ourselves. We must not become indistinguishable from, say, the National Rifle Association or the tobacco lobby. Toward this end, we should scrutinize ourselves as closely as we have scrutinized developing-country and developed-country governments.

We talk about government failures and market failures. Perhaps we should make sure that there will be no NGO or civil society failures, or if there are, that they will be less costly than the others.

We talk about government failures and market failures. Perhaps we should make sure that there will be no NGO or civil society failures, or if there are, that they will be less costly than the others.

With that in mind, perhaps some tentative arrangements can be reached, and we can move on to the action everybody is looking for.

Conflict and Food Security: Philippe Guiton

Africa Relief Manager, World Vision

First let me briefly introduce World Vision. World Vision is a Christian international relief and development NGO working to promote the well-being of all people, especially children. World Vision is now operating in more than 100 countries and in most of the conflict zones of the world.

Let me give you some data on conflicts. The world recorded 120 conflicts during the Cold War and has added 104 since the end of the Cold War. Of the latter, 88 conflicts have been purely domestic, which is a new trend, and 8 more have been domestic with foreign intervention. All conflicts that were temporarily suppressed by the confrontation of the superpowers resurfaced after the end of the Cold War, and often those conflicts have been exacerbated by ethnic and religious tensions. Many of the conflicts in Africa persist through looting of natural resources, illicit trade, labor exploitation, land seizures and mafia-style communal activities. Unfortunately, I can give you a long list of such countries.

One disturbing development is this: since the collapse of the Berlin Wall, the number of conflicts has diminished slightly, but conflicts are much more violent. Even more disturbing, 90 percent of the victims are civilians, mostly women and children.

Most of today's armed conflicts, whether domestic or international, are concentrated in the regions heavily dependent on agriculture. Links can be drawn between hunger and violence that emanates from the loss—or denial—of entitlement to food. Those links are both a result and a cause of armed conflict in the poorest countries. Thus food insecurity is not only a consequence of conflict but can also lead to conflict. Very few new conflicts start in food-secure environments.

In Sub-Saharan Africa, conflicts are caused primarily by poverty, greed, ineffective political

institutions, and lack of respect for basic human rights. The effects of armed conflict are well known. Conflict leads to the destruction of crops and livestock; denial of access to land and water; and the disruption of infrastructures, markets, and the human resources required for food production and distribution. Another well-known effect of conflict is population displacement.

Hunger often results from the combined effects of conflict, natural disasters such as floods and drought, and bad governance. Let me give you some examples. Sudan could easily feed itself were it not for the 18-year-old ongoing civil war. Land is plentiful and fertile, and the River Nile could be utilized for irrigated agriculture. But Sudan is chronically food-insecure. Combatants use hunger as a weapon of war, starving the opposing population into submission. In some cases food aid has been diverted by combatants on both sides, and humanitarian aid has been used to influence the population in support of one fighting group or another.

The Democratic Republic of Congo is another example. Fertile areas in the east used to produce surplus food, which was then sold to the main cities in the west of the country. Now the east does not even produce enough to sustain the local population. Conflicts have rendered access to the main markets impossible; occupying armies and rebel groups live off the people, confiscating all surplus food available; and in doing so, they discourage farmers from producing excess food. Thus farmers produce just enough for themselves to survive. As a consequence, most of the 1 million people who are internally displaced into the Kivu region depend heavily on western food aid to survive.

Unfortunately, donors seem oblivious to or uninterested in the plight of these people. Official development assistance dropped 21 percent over the 1992–97 period. Aid to Sub-Saharan Africa fell 13 percent during 1994–97 alone. And aid to agriculture plummeted almost 50 percent in real terms over the 1986–97 period.

In addition, around 10 percent of the total aid allocated to developing countries is used for emergency assistance. Although short-term, relief interventions to feed starving people are absolutely necessary to save lives, they do not offer a long-term solution to break the cycle of violence and hunger.

It is increasingly difficult for African governments, NGOs, and international institutions to secure donor funding for rehabilitation, long-term food security, and income-generating programs in countries that are in conflict or trying to recover from conflict in Africa. At best, donors have provided funding to reconstruct homes and public infrastructure. Although such projects are highly commendable and visible, they neither rebuild the economic system of a country nor help farmers increase their food production. In some instances, donors, United Nations agencies, and NGOs have aggravated already fragile situations by providing assistance without having a good understanding of the conflict dynamics, and have in the process unknowingly fueled the conflict.

There is some good news. Program tools such as the Local Capacity for Peace Framework have been developed to help identify the connectors and dividers within communities. With that knowledge, humanitarian organizations are better able to develop options that avoid increased tension and to provide better aid. In Somalia, World Vision distributed seeds and farming tools. Thanks to the hard work of the farmers and 12 months of peace, the farmers produced enough food in one season to sustain themselves for another year.

Let's be realistic. Food security for all will remain a dream as long as conflict exists, unless governments, international organizations, and NGOs implement policies and initiatives aimed at preventing, mitigating, and ending conflicts. Food security can defuse tensions and be used as a tool to bring peace. Improved food security will have to break

Most of today's armed conflicts, whether domestic or international, are concentrated in the regions heavily dependent on agriculture.

the vicious cycle of hunger and conflict. Specific action aimed at reducing poverty, increasing economic income, breaking war economies, and addressing the poor's basic human rights will reduce the risk of conflict within a country. All people have the right to have access at all times to sufficient food for an active and healthy life and, I would add, to live in an environment where they do not feel threatened.

The poor need to be given hope for a better future. Unfortunately, the present donors' policies combined with mistakes committed by NGOs and international organizations, and the bad governance of some African countries offer little, if any, hope to the poorest of the poor.

Let me make some recommendations, the first one to donors. Donors need to increase their assistance to poor countries. Aid needs to have long-term objectives, be sustained, and be given under strict conditions to avoid misappropriation. In addition, the beneficiaries of this assistance must be better targeted, preferably at the community or the farmer level.

Very few new conflicts start in food-secure environments.

Donors, international organizations, and NGOs—whether international or national—need to incorporate conflict prevention and mitigation in their relief and development programs. Programs must encourage rival groups and communities to work together toward common constructive goals.

NGOs need to constantly measure the impact of their work on the assisted populations to improve the quality of their work and programs, to avoid creating dependency on food aid, and to detect and deflect any tensions.

Finally, the international community needs to take strong actions to break the economy of war that prolongs conflicts, and to pressure fighting groups to respect human rights and the lives of civilians.

Right to Food:
Charlotte V. McClain

Commissioner, Economic and Social Rights, South African Human Rights Commission

As a South African and a member of the South African Human Rights Commission, I will primarily draw on the South African constitutional framework to discuss issues related to the right to food.

It is important to recognize that the right to food is probably one of the most widely proclaimed rights in international human rights law. A host of conventions, declarations, resolutions, and plans of action recognize the right to food, directly or indirectly. These conventions and declarations include the Universal Declaration on Human Rights, more particularly, Article 25; the International Covenant on Economic, Social, and Cultural Rights, Article 11; and the Convention on the Rights of the Child.

At the regional level, as well, a number of conventions speak to the issue of the right to food. In Africa, we have the African Charter of Human and People's Rights, Article 16, and the African Charter on the Rights and the Welfare of the Child, Article 14. South Africa has signed all of these conventions and ratified all but the International Covenant on Economic, Social, and Cultural Rights. In addition, many of these international provisions have been mirrored in the South African Constitution, which is perhaps the most progressive constitution of our times. It is a birth certificate of a nation founded on equality and human dignity, one that enshrines both civil and political rights, as well as economic and social rights.

The right to food in South Africa is entrenched in the Constitution. It is directly guaranteed and also found in different contexts in a number of constitutional provisions. Section 27(1)(b) provides that everyone has access to sufficient food. Section 28, which speaks specifically to issues related to children, provides that every child has the right to basic nutrition. And Section 35(2) guarantees the rights of detained persons to adequate nutrition.

The rights in our Bill of Rights do not exist in isolation from each other. In the famous case of the Government of the Republic of South Africa versus Irene Grootboom, the constitutional court stated that social and economic rights must all be read together in terms of seeing the Constitution as a whole. The court's landmark decision lay to rest any skepticism as to whether economic and social rights are enforceable or justifiable. The court ordered the state to provide housing to Ms. Grootboom and further ordered the Department of Housing to ensure that policies were in place to provide for those in desperate need of housing.

In our Constitution, some other economic and social rights affect the right to food, and they should also be taken into consideration. They are rights pertaining to health care services, water, social security, property, land, and the environment. When legislation is developed, it is essential that all of these rights are featured within the legislation.

What kind of obligations do these provisions impose on the state, on civil society, and on all the other parties? An interpretation of these provisions suggests that the state should guarantee that all people have access to a reliable supply of food. Therefore, the state must ensure sufficient production and distribution of the food. This may involve agricultural policy and planning, subsidization of production, and import and export policy and planning.

The link between the right to sufficient food and land tenure reform can clearly be noted. Lack of access to land for food production affects a family's ability to be self-sufficient food producers. The state must look into the geographic distribution of food to ensure that food is equitably distributed between areas of production and the rest of the country and to guarantee reasonable pricing of basic foodstuffs.

In times of need, the state must provide contingency plans for directly providing food for emergency relief. The state is obligated to provide food for those who are not able to acquire food for themselves. This does not suggest that the state must provide food packages to everybody. It suggests that the state should make sure the environment allows and enables people to provide food for themselves.

According to the judgment in the Grootboom case, each right has a minimum essential level, which, according to the International Covenant of Economic, Social, and Cultural Rights, must be satisfied by the state. That minimum core obligation is generally determined by the needs of the most vulnerable groups that are entitled to the protection of the particular right in question.

The second obligation of the state is to provide basic nutrition to children and adequate nutrition to detained persons. In the case of detained persons, adequate nutrition must be provided at the state's expense—the Constitution is quite explicit on that point.

With reference to children, the primary obligation is on the parents or caregivers. Where they fail, the state should step in to assist. The state, therefore, has no obligation to provide nutritional care where the parent or the guardian is able to do so. It does, however, have an obligation to provide the legal framework and administrative infrastructure to ensure that children receive the care spelled out in Section 28(1) of the Constitution.

This section bears review, along with Section 27(1), which guarantees the right to access sufficient food, and Section 27(2), which requires the state to take reasonable legislative and other measures to progressively realize this right. Clearly, there is no automatic right to food under these sections—an important point to stress. Instead, the obligation on the state is to foster conditions that enable everybody to obtain sufficient food for themselves.

I would briefly refer to the role of the South African Human Rights Commission. The Commission is a constitutionally entrenched body tasked with ensuring the respect, protection, and promotion of all the rights in the Bill of Rights. It is an independent and impartial body that, among other things, receives complaints of perceived violations of human rights. The Commission is also required by the Constitution to monitor the progressive realization of the economic and social rights in the Bill of Rights, including the right to food. Progressive realization means that the state must introduce legislation and other measures that are clearly targeted at achieving the goal of fully realizing rights within the shortest possible period of time. In essence it means that the State must progress, by setting out plans, with concrete goals.

The mandate of the South African Human Rights Commission in terms of section 184(3) to monitor the progressive realization of the economic and social rights is a mammoth task. In an effort to fulfill our constitutional responsibility the Commission developed a set of questionnaires, commonly known as the protocols. The protocols are sent out to the relevant government departments, at both the provincial and national level, on an annual basis to ascertain whether they have progressively realized the right in question. The Commission compiles a report with recommendations based on this information, and the report is then tabled before parliament. There is a specific protocol on the right to food.

The right to food is perhaps one of the better examples of human rights being indivisible and interrelated. It is essential to have an enabling policy or legislative environment that takes into consideration poverty and employment. It should identify the most vulnerable groups and the most food-insecure and, in a coordinated and integrated manner, protect all of these rights. Especially when vulnerable groups and persons are unable to ensure their own food security, it is the duty of the state to step in. Positive judicial precedents are essential if economic and social rights are to be taken seriously. In addition to legislative frameworks, awareness of the right is important. The bearers of these rights need to know the rights exist, and they need to know what kind of redress exists if the rights are violated. They also need to know what their various roles and responsibilities are in relation to implementing these rights.

...the right to food is a fundamental human right and critical to the enjoyment and attainment of many other rights.

In conclusion, the right to food is a fundamental human right and critical to the enjoyment and attainment of many other rights. Good governance, a stable democracy, the rule of law, a vibrant civil society, and a culture of human rights are all essential ingredients to ensuring that the right to food is progressively realized and enjoyed. And this is a right that the South African Human Rights Commission will promote, protect, and monitor vigorously.

Corruption:
Tunku Abdul Aziz

Vice-Chairman, Transparency International

I want to address a subject that is attracting a great deal of international attention. Corruption has come into the open. It is in the public domain and a subject of continuing debate all over the world. Yet not so long ago corruption was a taboo word.

Over the years, the World Bank, like some other development institutions, had become very much part of the problem of persistent corruption. So when Jim Wolfensohn first went to the Bank, he wanted to do something about it. When he mentioned his concern to his senior colleagues, they told him, "Jim, for heaven's sake, don't mention that word." He asked, "If I don't call it corruption, what do I call it?" They told him, "Call it the 'C' word." Evidently, we have come a long way since then.

Any person telling you that corruption does not hurt anyone, that it is a victimless crime, is likely to

be a politician doing what a politician does best: telling lies through his or her teeth (excluding, of course, the politicians here).

The first substantive point I would like to make concerns political governance. The problem of food security is often viewed in purely economic terms. In my view, that ignores what is probably a more important part of the equation, namely, political governance, which, unfortunately, has tended to receive scant attention. All of us concerned with the problem of food sufficiency appreciate that this Conference has recognized the role of governance in the overall scheme of things.

Good governance, the antithesis of corruption, must be embraced and adopted wholeheartedly because it holds the key to food security on a sustained basis. For that matter, it is the key to our future, which ought to be firmly grounded in fairness, equity, and human dignity for all mankind.

Corruption, however it is defined, widens the already yawning gap between the rich and the poor in many of the countries represented at this Conference. It inhibits socioeconomic development, undermining attempts by international and regional development institutions and others such as IFPRI to fight hunger and famine decisively. It distorts market operations. It deprives ordinary citizens of the benefits that should properly accrue to them, such as freedom from hunger in an age of plenty.

At its most pervasive, corruption compromises the sovereignty of nations. Not so long ago, Australia sent its troops into Indonesian East Timor—ostensibly to save it for democracy—in spite of strong diplomatic objections by a helpless Indonesian government. The government was so corrupt it had to swallow its national pride and eat humble pie. This is an extreme example, but it shows the insidious nature of corruption.

According to Transparency International, corruption substitutes competitive bribery for open competition. It retards private sector development and discourages investment. The destructive nature of corruption manifests itself in the implementation of sustainable food programs and other projects. Decisions are made not for public benefit. High-cost, complex, and prestigious projects are favored over cost-efficient, community-based initiatives using appropriate technology. And the results are totally predictable.

I make no apology for this rather long recital of the debilitating effects of corruption or unethical public behavior. We need to be reminded constantly of the evil of corruption and the need to confront it systematically, and with a will, if we want to ensure the viability of programs to feed the hungry of this world. Only by bringing corruption out in the open can we do something to contain it and prepare the ground for a bountiful harvest for mankind in desperate need of sustenance. That is, I am sure, the cherished hope of us all.

We must make serious efforts to recognize the inherent problems of food security for what they are: a combination of complex social, economic, cultural, legal, and political factors. Perhaps "conundrum" best describes the situation. Years of chipping away at the edifice of human hunger, misery, and degradation have done little to bring hope, comfort, and sustenance to the 800 million people—one-eighth of humanity—who lack enough food to live healthy and productive lives.

Food insecurity remains a global threat and human tragedy. By any measure, this is a miserable picture and does not reflect well on the efforts that have gone into the hunger alleviation programs—on which enormous sums of public funds have been lavished.

I find it extremely tempting to offer a glib, one-pill-kills-all prescription and heap the blame on corruption. The unethical behavior of public officials and politicians certainly bears on the slow pace of progress in the fight against hunger. But more useful to our ability to respond in a timely and effective manner would be an understanding of the real causes

Only by bringing corruption out in the open can we do something to contain it.

of corruption in those food-insecure countries where the problem is likely to persist.

These are extremely poor, badly governed countries in many cases, and they all share a common failure of not having the vital resources to put in place properly functioning institutions. They cannot be expected to develop and implement sound, long-term agricultural policies, including land tenure and water management, against a background of institutional instability. For countries themselves to contribute effectively to the planning and implementing process, they must have a modicum of good governance. An enabling environment is a minimum requirement for success. The experience of Transparency International in many parts of the world suggests that corruption thrives in societies where institutions of government are weak.

…corruption thrives in societies where institutions of government are weak.

Weak governments as well as weak business institutions may be likened to badly constructed load-bearing pillars of a house which crumble easily under the weight and pressure of competing demands for sustainable agricultural, social, and economic development. If we want a strong structure, we must pay more attention to the foundation on which the pillars rest. Good institutions are a prerequisite to good governance. No initiative, whether on food security or poverty alleviation or anything else, will work in the absence of ethical public behavior as a result of a poor governance culture.

I am a firm believer in the crucial role of governments in making things happen. Governments' ability to produce the desired results should not be underestimated. At the end of the day, governments set the moral and ethical tone and standards of public behavior. Their effectiveness, however, is only as strong as the political will of the leadership and the institutions that underpin their planning and implementation capacity.

In many countries, the government is plagued by mindless bureaucratic rules, regulations, and procedures—and a generally corrupt public service to boot. It is hardly surprising to find the specter of starvation once again casting its shadow on India, for example. The British newspaper, *The Independent*, recently published an article under the heading "Starvation Has Returned to India." It talks of India as a country with a granary swollen with rice and wheat—16 million tons of buffer stocks. But the government is selling it at well below cost to get rid of the surplus before it rots.

The Indian agricultural tragedy is not unique. It is replicated over much of the developing world. To put it bluntly, official corruption and incompetence distort the development process with actions almost bordering on the criminal. The grasping hands of corrupt officials are much in evidence when we see how much of the grain intended for the starving multitudes is traded on the open market for private gain.

Only systematic corruption can explain the complete failure of the poverty alleviation and food security initiatives in Kashipur in India, funded from 1977 to 1988 with 9 million British pounds from IFAD. According to that same report in *The Independent*, a large number of contractors and suppliers have made easy money without doing any work on the Kashipur project. No significant results—in terms of increase in income or sustainable agricultural productivity—have been achieved. There is no trace of even a single sapling, although it was claimed they were planted under the program. On a recent visit to the area, the journalist Rajaram Satapathy commented that payments were made for nonexistent works while roads were built from nowhere to nowhere. Meanwhile, the number of destitute families increased dramatically during the 10-year period covered by the funding

initiative. Today many face death from starvation.

This is not just an Indian story of corruption and criminal mismanagement. India's examples are simply better documented than those of the other food-insecure countries. India is a functioning democracy with a fiercely independent press, so things tend to come out of the woodwork more readily. The story rings a bell in much of the developing world and, in particular, Sub-Saharan Africa.

Perverse policies take a heavy toll on sustainable food security. Again, I refer to India: a mix of minimum support prices for wheat and rice, coupled with an overly generous state subsidy for power and water supplies, has resulted in an increase in the acreage under rice in the traditionally wheat-growing areas of the Punjab. On the face of it, there is no serious flaw in this arrangement except that rice production, which has grown from 120,000 hectares in the 1960s to 6.5 million hectares, has affected Punjab's water tables. They are dropping rapidly, negatively affecting the fertility of the soil. The future of sustainable food production in India's food bowl is seriously at risk.

The real issue is this. The war to end starvation, ignorance, disease, and poverty in food-deficient countries cannot be waged in isolation. It must take fully into account their political, economic, social, and cultural development to establish whether or not appropriate conditions exist that will enable them to play a proactive role in shaping their own future.

Countries that are apparently incapable of providing sufficient food for their own people will need help restructuring their economic, social, and governance systems. That restructuring is necessary to bring them into the mainstream of regional and international perspectives so they may enjoy a higher degree of prosperity, better education, gainful employment, and freedom from hunger on a sustainable basis.

Good governance—open, transparent, and accountable—is the best antidote for the cancer of corruption.

In conclusion, financial resources alone will come to naught if good governance is missing from the equation. That single element is absolutely needed—in the management of both the state and the business sector—for an orderly transition from basket case to finely tuned engine of growth. Good governance—open, transparent, and accountable—is the best antidote for the cancer of corruption.

Studies on the impact of corruption should be undertaken to establish the extent of the damage done to the whole food security process. Currently, very little authoritative material is available to assist decisionmakers in this area of food security.

Discussion

A stimulating discussion took place on governance, and issues ranged from how to stop corruption to the effects of conflict, from the differences between written law and actual practice to the establishment of a global institution, and from corporate governance

to civil society accountability.

One of the key topics of discussion was how to stop corruption. A participant shared the following story. Nine years ago, a small group of people went to a community in Rajasthan and started asking questions: How much money is coming into your village? How is it being spent? After they collected this information, they instituted public hearings. They called the politicians, the bureaucrats, and the engineers and shared openly in front of a thousand people how the information was collected and how much money had actually reached the people. This revelation generated so much anger and disgust that, for the first time in the history of independent India, without the law, without the bureaucracy, without the politicians, they actually returned the money. How is it possible to tackle corruption at that level without depending on the law? The open and transparent community pressure on those people who are corrupt was so acute and humiliating that they actually returned the money. Therefore, this participant argued, public hearings should be institutionalized. The hearings would not be courts of law, but open hearings where all members of the community could plead their cases and apply community pressure to those who are corrupt. Tunku Abdul Aziz added that the developed countries were also at fault for pouring money into poor societies, where the risk of temptation would be so strong.

A second key topic was the issue of conflict. A participant drew attention to the conflicts between pastoralists and governments in Sub-Saharan Africa. There are about 40 million pastoralists, and conflict often arises in these communities because most of them occupy marginal areas, where the rebels who attack governments also tend to hide. The pastoral communities play an important role in food security, contributing 80 percent of the beef in Kenya, for instance, so conflicts in these communities should be mentioned. The participant continued by asking, What is the role of women in conflict? In some cases, women actually raise money, by selling baskets for instance, to buy arms for their husbands. As women play a significant part in food security, it is important to think about their role in conflict. In response, Philippe Guiton commented that throughout the world women are usually much more eager to live in peace than men. World Vision is trying in all of its reconciliation projects to give a voice to women so that they can demonstrate by their actions that they do not necessarily hate their neighbors and they can prove to their husbands and the males in the community that there is a way to live together. Another participant added that the blatant violation of the tenets of good governance, such as transparency, property, accountability, respect for human rights, and the rule of law, is a symptom of fatal conflicts in developing countries, particularly Africa. And yet in most cases the developed countries adopt a wait-and-see attitude, or worse, even actively support such governments until the inevitable explosion occurs. Then, everyone runs around frantically picking up the pieces. Sanctions that tend to hurt the population more than the oppressive leaders that perpetrate these intolerable violations obviously have not had the desired impact of preventing conflict.

Is there any other way to deal with such leaders if we do not want to give military adventurists the opportunity to initiate a violent takeover? In response, Guiton suggested that conflict prevention and mitigation should be included in all projects. Tools have been developed to identify tensions and connectors and dividers within communities. Programs can be built on the connectors to bring people together and to defuse tensions.

In reference to Charlotte McClain's presentation, a participant pointed to the difference between theory and practice. A good constitution does not necessarily mean human rights will not be violated. The problem is not having the right constitution, but enforcing the rights. What is the relationship between a good constitution and the violation of rights in terms of food security? McClain indicated that the Commission in South Africa has not yet received a complaint on issues related to food. This fact does not mean that everyone is enjoying his or her right to food. It means that a lot of people do not know that this right exists, and the sectors that do know still need to be guided in formulating ways to bring action against the violation of this right. It is important to educate the nation that a citizen can claim the right to food. On the other hand, the rule of law is important, and there is a need for a strong and independent judiciary and a vibrant civil society that knows which laws are in place. Legislation is just one tool.

Another topic was the formation of a global institution to enforce the right to food. A participant introduced this topic by stating that any right, including the right to food, can only be put into practice when it is accompanied by an institution that has the power to place sanctions on those who trespass this right. In times of globalization, we need a global institution. McClain agreed with the need for a global institution and noted that the committee that oversees the International Covenant of Economic and Cultural Rights does not impose sanctions; it studies reports that come in from state parties and makes recommendations and observations. One solution is to adopt a form of shaming in the international arena. Currently a draft optional protocol is looking at how individuals from state parties can bring complaints directly through to the committee, but it is still a rough draft.

The issues of civil society governance and corporate governance were explored. A participant reiterated the danger of civil society failure in governance. If a women's group, a farmers' group, or a village committee suffers from poor governance, lack of ownership, and corruption, then how can civil society be expected to be pro-poor and to assist in lobbying the government? Another participant stated that there is a tendency to talk about political governance and to ignore issues of corporate governance. The mismanagement of the private sector and multinational corporations plays a role in promoting or inhibiting food security. Aziz added that until recently developed-country governments encouraged international companies to use bribes to win major contracts in developing countries. This practice smacks of a double standard of the most vicious kind. Competence is also a real issue in developing countries. In many cases people do not even know what the law says

about corporate responsibility and audited statements, and the result is implicit corruption. People may not even understand what a court order is, and this lack of capacity perpetuates the situation. The donor community and the North-South partnerships dealing with corruption must look at the problem and first ask if it is a competency issue and if so, whether a concrete, positive intervention can be made.

When a participant expressed concern about weak political structure and the inability of certain countries to implement existing biosafety legislation and regulations related to biotechnology, Aziz responded that it is mainly a concern of those countries that are able to handle these kinds of new technologies. In Sub-Saharan Africa this sort of problem is far removed from daily practical experience. Aziz agreed, however, that it does take a strong political structure and resources to run a good government.

A participant emphasized the need to join the human rights circles with the development and food security circles. Another participant criticized IFPRI and the CGIAR for paying too little attention to the social and cultural aspects of stimulating and sustaining processes of empowerment, pro-poor community development, and innovation. The participant also argued that during the meeting, not enough attention was paid to the social construction process of good governance and of food security, which are linked, and asked if there were ways of measuring impact and of monitoring work in sustainable agriculture and food security. Invited by the Chair to respond, the director general of IFPRI, Per Pinstrup-Andersen, said that IFPRI does need more research on social constructs as they relate to achieving food security, including governance issues. Second, IFPRI is engaged in a learning process on the evaluation of impact. IFPRI has evaluated the impacts of its own programs a number of times, but it is also establishing a consortium to develop better methods to do so.

Several queries were expressed regarding Transparency International. How does the organization intend to tackle the issue of corruption, especially in countries where some of the people entrusted to get rid of corruption are themselves swimming in it? Apart from researching the growth of corruption, what is the organization's solution? When another participant asked how Transparency International developed its corruption ratings, Aziz explained that the Corruption Perceptions index is based on several independently administered surveys by international companies, political risk analysts, and capital risk analysts, among others.

The Chair, Solita Monsod, concluded the discussion session by making three points. One, we have a window of opportunity. Two, we must remember who put the governments there that we are criticizing. Three, if all else fails, we actually get the government we deserve.

The illustrations and text featured here are by Marcel Niyungi Bin Yungi, an artist born in Zaire and now living in Kenya. The 2020 Vision Initiative commissioned him to create comic strips depicting his perspective on key food security issues.

Part 4

Sustainable Food Security for All

Realizing the Vision

Chapter 21

The Roles and Responsibilities of Industrialized Countries in Assuring Sustainable Food Security

Chair: Grace Akello
Minister of State for Entandikwa, Republic of Uganda

We have all been talking about globalization as if it were a new thing. In my opinion, globalization is a continuation of the world economic and political order of the last 150 years. It can be traced back to the search for spices, followed by the search for raw materials, followed by the search for markets, followed by the search for industries in all areas, all of which started in Europe those many years ago. Broadly speaking, this path created an economic order of a developed first world and an underdeveloped third world. This era of globalization brought the world together in an unequal relationship. It gave those countries whose people ventured out first and exploited nature first the advantage of better livelihoods and higher standards of living.

Globalization seems to be new precisely because those advanced countries, which were able to exploit the elements of nature earlier, have created more wealth and have built on that wealth to continue the exploration and exploitation of global elements for the betterment of their societies. Now, instead of building more castles or better housing for their people or palaces or roads, they have opened a window of opportunity for us to see how the other half lives. Thus even in my underdeveloped village in Uganda, I can press a button and immediately be in contact with Paris or New York or Washington or Copenhagen, or whichever part of the world I would like to communicate with. By the touch of a button, anyone with a computer can reach anywhere on the Internet.

Knowing how the other half lives is the challenge that brings us together. We question whether it is fair that the other half of humanity lives as it does. So here we are, in a very practical manner, trying to reorder the world, starting with the most basic of all human needs: food security.

We all seem to be insulted by the fact that any child in this world should die because of hunger—which we should be. But where do we go from here? There should be clarity of vision for all of us. We should know who is going to do what, when, where, and with what resources. What should all our parliaments do? What should the world executives do, the governments? What should the implementers, the permanent secretaries, the civil servants do? What should the private sector do? And what should civil society and the NGOs in our global world do?

The analogy of a global pyramid is apt. At the pinnacle of the pyramid is the First World. At the bottom is the Third World. Down in the Third World, we find poverty, unemployment, corruption, declining terms of trade, rising cost of inputs—society bogged down with no way to get out of the bog.

From the bottom of the pyramid we look up to the First World and see a distorted economic order, in which we are told we have nowhere to start, or that we must start in a certain manner. If we have started, we're told, "No, don't do that. Privatize. Liberalize. You can't enter this market.

You can't enter this market on these terms." Or "Yes, we support our farmers in the First World, but your farmers are not supposed to get subsidies. You have to produce as we dictate to you."

Because that angle is blocked, we try to look at another angle and say, "Okay, since life is impossible down here, we are going to go there where life is a bit more livable." So we aspire to go to the West. We have our refugees and asylum seekers. Some of them run away from the Third World not because they are persecuted but because they are looking for a better economic life for themselves. We have dependence, which the western world is not happy about. Every year we get less development assistance. It goes lower and lower. That is a sign that the First World is tired of supporting us year in and year out. But we are saying that, if life is better there, in the First World, than here, in the Third World, we are going to go there. And when we arrive, we arrive with our problems.

If those of you in the First World don't want us to do what we think is right and you're not helping us and you're not understanding what we are saying, then we will come to your world.

That is the pyramid. Up at the top everything is all right. I can see that. This morning—here in Germany—I wanted a cup of tea and an egg. They brought me a cup of tea, an egg, cheese, bacon… I don't need all that. But that's what we all aspire to. Someday I hope we will all have a multitude of food to eat in the morning.

If those of you in the First World don't want us to do what we think is right and you're not helping us and you're not understanding what we are saying, then we will come to your world. Can you give us all a breakfast tray—food every morning for all of the billions of people from the Third World who want to come here?

Keynote: Uschi Eid

Parliamentary State Secretary to the Federal Ministry for Economic Cooperation and Development, Federal Republic of Germany

In setting priorities and deciding whose responsibility it is to end hunger in the world, we should use unequivocal language. So I have used provocative wording in the three fundamental hypotheses and four areas for action I present here.

Hypothesis 1: It is not the exclusive responsibility of the industrialized countries to end world hunger. Unless developing countries combat corruption and achieve good governance, progress on democratization, and peace, there will be no solution to the problem of world hunger.

In a poll among German workers in food security projects, a majority indicated that corruption and cronyism in the developing countries has contributed to a significant deterioration of the food situation. The 1998 Nobel Prize laureate, Amartya Kumar Sen, made a point of noting the links between hunger and political systems, between hunger and fundamental democratic values. Examples such as Zimbabwe show how damaging ill-conceived policies can be. Zimbabwe has the potential not only to feed its own people but to help feed other countries; instead it ends up in need and has to rely on considerable levels of cereal imports.

FAO considers 23 countries to be severely affected by hunger. Most of them are characterized by permanent instability and violent conflict, as well as poor governance, usually combined with unpredictable weather conditions, harvest failure, poverty, and population pressure. The situation in Eritrea and Ethiopia shows how quickly a problematic food situation can become much worse once

human and financial resources are wasted on war. The developing countries need to face up to their responsibility, aided by the international community.

Hypothesis 2: The industrialized countries are also contributing to hunger in the developing countries. It is the political, moral, and legal responsibility of the industrialized countries to end their ill-conceived policies of the past.

The developing countries are currently losing some US$40 billion a year in income as a result of the industrialized countries' agricultural protectionism (this was a 1995 World Bank estimate). If you consider that the EU alone is spending an annual 40 billion euros on subsidies for fewer than 7 million European farms, while at the same time spending a mere 7 billion euros on development cooperation (the sum spent by the EC, excluding member states' development cooperation), you will realize the absurdity of it all: almost 5,800 euros from the EU budget go to every single European farmer, while a mere 1.4 euros go to each person in the developing world. Every citizen of the EU—there are currently 376.68 million—is paying well over 100 euros per year for subsidies to the EU agricultural sector and just under 20 euros for global stability and the fight against poverty and hunger. To me, those are unacceptable proportions.

Local markets in developing countries have frequently been disrupted by subsidized exports from industrialized countries. By way of example, consider beef in West Africa, poultry in Yemen, tomatoes in South Africa—and these are only a few items in a long list.

In the area of emergency relief, premature offers of aid by western nations have often prevented the achievement of internal solutions. The food needed is often available within the country or at least within the region and is just in the wrong place. Imported food from the EU (or other industrialized countries) hampers the marketing of local production, which tends to be low to begin with, and prevents the development of a sustainable, self-reliant food supply. Principles such as making it a priority to buy food in regional markets and giving greater attention to nutrition habits have resulted in improvements in this regard. Ninety-five percent of the food Germany gives as aid is now purchased in developing countries.

It is the political, moral, and legal responsibility of the industrialized countries to end their ill-conceived policies of the past.

The development of our agricultural sector, like all sectors of the economy, must not take place at the cost of the developing countries. The industrialized countries must accept this responsibility.

Hypothesis 3: Fighting hunger is not high on the public agenda. If we continue with business as usual, we will fail to meet the World Food Summit target of halving the number of hungry people by 2015. We need to do more, but we also need to do things differently.

Expenditures on food security measures are on the decline, as is spending on agricultural development. So we need to set clear priorities. In its report *The State of Food Insecurity in the World 2000*, FAO suggested that priority attention should be given to people who suffer from hunger the most. According to FAO, a country with high prevalence of undernourishment and a daily dietary energy deficit of more than 300 kilocalories per person should strive to reduce the depth of hunger as a top priority to prevent further expansion of the problem. I share that view.

What factors determine people's food situation? It has come to be universally accepted that the causes of hunger go far beyond insufficient food production. Food security measures must, above all, improve hungry people's access to food. Such measures also need to foster education and health, to ensure that the food consumed will be not only sufficient but healthy. Also, we have learned that good governance, relatively democratic structures, and a certain measure of freedom of the press are of great importance for the food situation of the people of a given country.

The international environment also has an influence on food security: WTO rules and the agreements relating to biodiversity and intellectual property (the Convention on Biodiversity and

TRIPS) have a clear impact on the options available to people in the developing countries to provide for themselves or to import food. New technological developments such as those in the area of genetic engineering are also relevant for the developing countries. While genetic engineering is not the answer to hunger in the developing countries, we must not ignore the potential that this technology offers to these countries. It is essential in this context that poor population groups be given access to these innovations and that countries have relevant legal provisions and capacities for safety analyses.

This all goes to show that the challenges of food security have implications for other important policy areas as well. On the basis of these three hypotheses, I would now like to recommend four areas for action.

In the area of emergency relief, premature offers of aid by western nations have often prevented the achievement of internal solutions.

Area 1: The ill-conceived agricultural policies of the past must be ended. The turnaround in agriculture to which the German government has committed itself is a step in the right direction.

Globalization and global organizations such as WTO can be criticized for a variety of reasons, and some of the fears of the antiglobalization movement are understandable. However, a great deal can be said for global regulatory arrangements when their rules are based on social and ecological sustainability. We can, and we will, use the current WTO negotiations to reduce the deficits described under Hypothesis 2. This implies four specific demands:

1 The EU and other countries must reduce and ultimately abandon export subsidies and other forms of export subsidization to prevent distortions in developing countries' local markets.
2 Industrialized countries must open their markets to a greater extent to products from developing countries to enable those countries to earn much-needed foreign exchange. Some initial steps have been taken, such as the EU's Everything but Arms initiative, which grants least-developed countries tariff-free access to EU markets. I call upon other industrialized countries to join this initiative. Further tariff improvements should be sought within the scope of the Generalized System of Preferences, and we need to help the developing countries make use of the opportunities arising as a result. Nontariff trade barriers such as those related to sanitary and phytosanitary rules and standards must not be allowed to bar imports either. We must help the developing countries meet, monitor, and, if necessary, certify these standards.
3 The developing countries have the right to protect and foster their own agricultural sectors. This applies both to external protection measures and to forms of internal support.
4 Given the continuing liberalization of the world market, the new WTO round needs to take into account more efficiently the specific situation of low-income and food-deficit countries.

Area 2: Other international agreements and processes must support the goals of the World Food Summit.

The protection of biodiversity is indispensable for food security. Without the treasure of genetic resources that have been safeguarded for centuries, no progress will be possible in the area of breeding. So protection must by no means fall prey to commercial utilization. In concrete terms, this means that the TRIPS provisions must not contradict the goals of the Convention on Biodiversity. The developing countries must retain the right to

frame national law in such a way that, for example, purchased seeds can be reused for sowing and for local research. The German government also emphasizes the sovereignty of all countries over their traditional knowledge and their local genetic resources. The benefits arising from the use of these resources should be shared in a balanced and equitable way.

Another important factor influencing global food security is global warming and climate change. Tropical storm "Usagi" recently destroyed some 20 percent of the rice harvest in a northeastern province of Viet Nam and caused the loss of the soybean harvest on a total area of some 19,000 hectares. Yet that story and others like it barely make the news anymore. All countries need to continue to step up their efforts for climate protection, because it is the poorest countries and the poorest population groups that suffer as a result of the way we treat our natural resources. Other natural resources, especially soil, water, and aquatic resources, are under threat as well. Here, too, national and international action is vital to safeguard the fundamental prerequisites for food production. That is why I believe that food security should be part of the agenda of the Rio+10 process.

The EU and other countries must reduce and ultimately abandon export subsidies and other forms of export subsidization to prevent distortions in developing countries' local markets.

Area 3: Legal reform in the area of land rights and improvements in credit systems are priority issues for rural development. The fight against AIDS in rural regions must be given greater attention than in the past.

Supporting rural development is a complex task. It involves all dimensions of sustainable development (economic, ecological, social, and political), and it requires a multisector approach (agricultural and nonagricultural production, education, health) addressing multiple levels of intervention (from the local to the global). The range of activities needed is accordingly quite broad, extending from the introduction of appropriate market and price policies all the way to fostering education and health. The German experience has shown that supporting agrarian reform and improvements in the rural credit system are central factors for success. The German government therefore attaches special importance to agrarian and land reform and advocates relevant action in its policy dialogue with the governments of its partner countries. It provides financial and advisory support, for example, to tenancy reforms, socially compatible distribution of land, and securing a legal basis for access to land or landownership, especially for women.

However, all these efforts are threatened by AIDS, which, in parts of Sub-Saharan Africa, is largely rendering useless our joint efforts for development. The international community has therefore committed itself to combining forces to fight the disease. The rural poor must be included in that effort. In German development cooperation, we have made the fight against HIV/AIDS a cross-cutting issue that is being mainstreamed into all projects.

Area 4: The point is *not* above all else to produce more food but to make food accessible to hungry people.

Sufficient food is produced worldwide to sustain humankind. The problem is that not everyone can afford the food. That is why poverty reduction and income-generating measures are indispensable. Even if sufficient food is available, people might still suffer from undernutrition or malnutrition. To fight the "hidden hunger"—iron, iodine, or vitamin A deficiency (micronutrient malnutrition)—food and health counseling is an essential and promising activity. This is an area where women play a vital role.

In its *State of Food Insecurity in the World 2000* report, FAO describes the 1982 program of the government of Thailand. The government conducted a broad-based information campaign for poor rural people, training and mobilizing volunteers—1 for every 10 households. The aim was to increase production of fish, chicken, vegetables, and fruits; correct detrimental eating patterns; and improve health care. Within 10 years, the more severe forms of malnutrition were eliminated.

Examples of this sort show that it is possible to overcome hunger and undernutrition if efforts also address the structural conditions prevailing in a country and if people are part of the changes. In this way, we can succeed in gradually ending the need for emergency relief.

In its calculations for 2000, FAO arrives at the conclusion that if we keep maintaining our efforts at previous levels, we will only reduce hunger by less than one-third by 2015—thus failing by far to meet the goal we have all subscribed to, namely halving the number of people suffering from hunger. It is the shared responsibility of industrialized and developing countries to do their utmost to prevent such failure. We need to learn from our mistakes, we need to make use of the new global regulatory agreements for the benefit of our objectives, and we need to improve the concrete efforts under way at the national and local levels. To that end, a great deal of commitment and assertiveness is required on the part of all players—especially when it comes to putting one's own house in order.

Industrialized countries must open their markets to a greater extent to products from developing countries to enable those countries to earn much-needed foreign exchange.

Chapter 22

Setting the Priorities for Action

Chair: Keith Bezanson

Director of the Institute of Development Studies, University of Sussex

At this Conference we've heard a comprehensive diagnosis of the disturbing realities of our food-insecure world. Our challenge now is to move on from the diagnosis and set some priorities. This is usually the Achille's heel of international conferences. We usually end up adding things to agendas and trying to include the views of everyone in order to have a consensus. This is why, it is claimed, international conferences often fail. If everything must be done and everything is interdependent, that usually means there are no priorities. When everything is claimed as a priority, nothing is really a priority.

Of course, many things are interrelated and important. Still, in a world of scarce resources, some investments yield more benefits than other investments. Remember that the title of this Conference is not merely "Food Security for All by 2020." The subtitle is "From Dialogue to Action." That is our challenge: to move from dialogue to action.

We should try to move the international agenda forward, not by declaration or admonition or expressions of moral outrage, but with some sense of what the priorities are and what actions can be taken.

Now, you will almost invariably want to change the order of the priorities we set. I am always reminded of a story Henry Kissinger put in one of his books about his first visit to Israel. He was Secretary of State, and he is also of the Jewish religion. Golda Meir was the President of Israel at that time, and he was anxious to establish priorities.

Rajul Pandya-Lorch, head of IFPRI's 2020 Vision Initiative, identifies the priority actions required to achieve sustainable food security for all by 2020.

So in his first meeting with her, he said, "Madam President, I want to make my priorities clear. I am first an American. I am secondly the Secretary of State. And I am thirdly a Jew." And she said, "Mr. Secretary, it's quite all right. Remember, in Hebrew, we read backwards."

So regardless of their order, if you could do only two or three things, what would you do? Not that other things aren't important. But what two or three things would really make a difference in building food security for all? That is what we must decide before we can act effectively. I look forward now to this panel and the audience helping all of us to decide on the key priorities.

Introduction: Rajul Pandya-Lorch

Head of the 2020 Vision for Food, Agriculture, and Environment Initiative, International Food Policy Research Institute

Achieving the 2020 Vision of sustainable food security for all by 2020, or soon thereafter, will require getting the priorities right and acting upon them. IFPRI has drafted a paper suggesting the policy actions that are expected to be of high priority globally or in a very large number of countries. Of course, these are not the only actions that can be

taken, but we have selected what we consider high priority.

The backbone of any successful attempt at achieving food security will be pro-poor economic growth together with effective provision of public goods. These in turn will call for actions in several priority areas, which I will present not in order of priority but from the micro to the macro.

The backbone of any successful attempt at achieving food security will be pro-poor economic growth together with effective provision of public goods.

First, investment in human resources is essential to help people escape poverty and food insecurity. Low-income, sick, and malnourished people are likely to remain food-insecure, and their children are likely to have few opportunities for better lives. Within this priority area, we need to focus on improving access to health care and education. Why these two in particular? In the case of health care, HIV/AIDS has exploded in the last 5 to 10 years, particularly in Sub-Saharan Africa, and is set to explode further in the South Asian and East Asian economies. This burgeoning crisis makes investment in health care very important. In the case of education, strong evidence suggests that investment in education has played a major role in reducing child malnutrition in the last 25 years or so and could do so in the future.

However, without efforts to improve access to productive resources and remunerative employment, the second priority area of action, investments in education and primary health care may have little long-term effect on the well-being of the poor. We need to continue to invest in broad-based agricultural and rural development. After all, the majority of the poor currently live in rural areas. At the same time, we need to focus on generating secure urban livelihoods. The gravity of hunger and food insecurity is beginning to shift from rural areas to urban areas, and it is increasingly likely that soon there will be more poor people in urban areas than in rural areas.

While access to productive resources and remunerative employment is critical, the third priority area of action is to improve access to markets, appropriate infrastructure, and facilitating institutions.

The fourth priority area is to expand research, knowledge, and technology, which are critical inputs into the efforts by poor people to increase their productivity and improve their well-being. Two things are of note. First, in the last 5 to 10 years, there has been an unprecedented increase in the opportunities available in terms of appropriate production technologies. A number of technologies that work in different settings are available. The challenge is to investigate the various technologies and assess what works in what situation. We have more technological options and opportunities available than ever before. Second, there has been a similar explosion in information and communications technologies, which has opened doors that were not open even a few years ago. These new technologies give us the potential to transform agriculture by transforming livelihoods and generating incomes for people in large parts of the world.

The failure to manage natural resources sustainably will result not only in environmental degradation but also in further poverty and food insecurity. This brings me to the fifth priority area of action: sound management of natural resources. Recall that our aim is not just food security but sustainable food security. In this context, it's important to recognize that water may well emerge as the most binding constraint to food security in coming years. The challenge to overcome water scarcity and water quality constraints is paramount if we are to assure sustainable food security. Related to that is the challenge posed by climate change. It behooves us to pay more attention to

how we are going to cope with the consequences of climate change in the coming years and prepare ourselves for the implications for food security.

Good governance and sound national and international macroeconomic policies are also critical to provide the environment within which these actions will be most effective. Globalization is a phenomenon that is here to stay. The challenge is how to shape it so that globalization benefits the food-insecure and the poor and does not impoverish those who are currently not food-insecure or poor.

The causes of food insecurity, malnutrition, and unsustainable management of natural resources are complex, and comprehensive solutions drawing on all of these priority areas will be needed. There is no silver bullet that will achieve the 2020 Vision, but with the discussion here we hope to identify the priority areas of action.

Ian Johnson

Chair, Consultative Group on International Agricultural Research, and Vice President, World Bank

I would like to begin by saying that the document prepared by IFPRI—"Sustainable Food Security for All by 2020"—is a very useful benchmark for our thinking about priorities: the nine drivers influencing global food security and the seven priority areas for action are well articulated. I think one should be cautious about selecting priorities. Priorities very much depend on country circumstances. The right package of priorities in one country may be very different for another.

To start, we need to consider how to make the issues a priority in the first place. We are all converted. The question is, How do we get our issues onto the public policy agenda domestically and internationally? That is the first problem I want to raise.

I read a very important book years ago by Michael Lipton called *Why Poor People Stay Poor.* It was all about urban bias in public policymaking. Much of that bias remains even today—national policies are not directed at agriculture, food security, and the rural sector—so that's an area we have to work on. The same bias holds at the international level. So one of the big questions for us is, What tactics can we all employ to get those who are not converted to focus on this issue and become converts?

How do we get our issues onto the public policy agenda domestically and internationally?

Second, what is the link between economic growth and agriculture? That link has been underplayed over the last several years. Although food security is about food, it is also about incomes and wealth creation. Income growth in both the rural and urban sectors will come from economic growth; and in most countries of the developing world, that economic growth is going to come from the agricultural sector. Therefore, agricultural productivity remains a very high priority, especially in Sub-Saharan Africa.

But sometimes yield and productivity do not come up as a priority. I think it is a big issue, but under a new set of rules. Yield and productivity are now linked to what is often called the triple bottom line, with environmental responsibility and social accountability as the other components. If we don't begin to think of yield gains in that framework, we will not achieve food security in the next 20 or 30 years.

My third point relates to institutions, by which I mean the way we relate to one another in the public sphere. We had absolutely the right institutions for the turn of the century. Unfortunately, I mean the turn of the last century, not the turn of this century. We need new institutions—not new organizations, but new arrangements.

We have heard about some powerful examples of transparency operating at the local level in India. We need new stakeholder formulas where producer associations, consumers, farmers, and others can play a part in overall decisionmaking. We do not have those frameworks, so this is a high priority area.

Linked to that, another important priority is to build a platform for serious, professional, and

informed discussion of science and technology as it applies to agriculture. Developing countries run severe risks of being left behind in this area. The asymmetry of this risk, and its consequences, need to be seriously considered. Biotechnology, genetic modification, and other issues have got to be aired on a sensible platform among all stakeholders.

Next I would point to the rise in the notion of public goods, whether at the global or local level. Some issues that affect us at the global level, like climate change, are relatively obvious, but others are less so. We live in a world without boundaries now, where, for example, animal disease patterns are shifting dramatically and having a big impact on food systems. We also now have environmental refugees. These and other areas must be addressed through research and public policy. One of the biggest mistakes the world has made is to underinvest in both national and international research in agriculture and food security. Such research provides an 80 percent rate of return. It is one of the best investments we can make, and yet overall funding for this crucial sector has declined.

...another important priority is to build a platform for serious, professional, and informed discussion of science and technology as it applies to agriculture.

I would make a plea for research funds not just for the CGIAR, but also for national agricultural systems and, of course, for new arrangements with the private sector and the complexities that that brings with it.

Trade is another important issue. The OECD countries spend three times more on trade and agricultural subsidies every day than they provide to the CGIAR on an annual basis. That massive investment in subsidies must be reversed.

Having said that, it is wonderful to hear the German Parliamentary State Secretary and others say we are going to take on this issue of agricultural trade subsidies. But let us be careful to ensure that nonpricing mechanisms do not replace subsidies. We need to deal with trade but not be hijacked by it. Trade is not just a subsidy issue. It encompasses a broad range of issues, from pricing subsidies, to multifunctionality, and other forms of nonmarket barriers.

Let me conclude by reiterating that, at the international level, we have got to do a better job of advocacy. In the World Bank I have to do a better job with my colleagues about convincing them of the absolute importance of agriculture, rural development, and food security issues to the overall sustainable development agenda. We all have to increase our own efforts in these areas.

Twenty years ago, 40 percent of World Bank lending went to rural development and agriculture. For the last 10 years, that figure has been about 14 percent. Last year it was down to 7 percent. The decline is not entirely supply driven by the World Bank. It is also the demand response of governments not necessarily wanting to borrow for these issues. We have a big job to do in advocating for agriculture, and hopefully reversing these trends, and we intend to do it.

So let me again thank IFPRI for contributing a very good report that sets out the agenda for achieving food security. I hope that by focusing on two or three areas we can make a difference.

Stewart Wallis

International Director, Oxfam GB

We do need to be careful about setting priorities, but I'm going to stick my neck out and set them nonetheless. I'm going to suggest three priority areas: empowering women, in particular through girls' education; making markets, particularly primary product markets, work for poor people rather than against them; and tackling conflict in the world.

The case for empowering women, and particularly for investing in girls' education, has been

powerfully made. The crucial point is to involve women's groups, hunger and food groups, NGOs, civil society more generally, and specifically people in the education field. We all need to work together to tackle the scandal of girls' education. That is one of the most important long-term changes we can make and the biggest commitment we can make toward overcoming hunger and many other injustices in this world. That is my first priority.

Second, we must take up the whole area of trade and make markets work for poor people rather than against them. We have heard a lot of talk about a level playing field. For many people, the playing field is not level at all, but a vertical cliff. That is a fundamental issue we need to tackle.

Several speakers have made strong commitments to phase out export subsidies and dumping. Let's hold people to those commitments. Making that happen will help.

We've also heard a lot about access to northern markets and tariff and nontariff barriers. Eliminating those barriers will make a big difference to people in some of the poorest countries. But they are only part of the story. Many other things are needed to make markets work for poor people. We've heard about credit and access to education and health. Infrastructure tends to get forgotten. There is a huge correlation between how poor people are and how far they are from the nearest port. And community involvement in rural infrastructure can make a big difference. Some of Oxfam's most successful projects have been those where we worked on both the supply and the demand sides of an economy at the same time. Involving people in building the infrastructure themselves has put money in their pockets and helped get the economy going in an area where demand was very low.

Other areas are crucial as well. We must protect the most vulnerable under liberalization. We often ask the wrong question. The issue is not whether liberalization is a good thing or a bad thing. Instead, we should ask what policies—national and international—make liberalization work for rather than against poor people, what policies capture the gains for poor people? That's the question we need research on and the area that needs more work.

We need a development box in the next WTO round. We need to protect the most vulnerable people, not expose them to the full gale of a market before they're able to compete.

Two other more controversial areas fall under markets. About 1 billion people in this world derive their main income from the export of commodities. In Africa, 75 percent of earnings comes from export commodities. We know what's happening to the terms of trade, and we know what harm price fluctuations bring. We must look again at the whole issue of price stabilization and remedies such as insurance schemes or commodity stabilization funds. Everyone has said the problem is too difficult. But DeBeers managed quite well with diamonds—a very special case. OPEC did not do such a bad job. Markets, in the end, are social and political constructs. They're not some economic black box. If we have the will, we can do something about fluctuating prices and make it work for both urban and rural people.

We need to protect the most vulnerable people, not expose them to the full gale of a market before they're able to compete.

The other difficult trade issue is international monopoly. Six companies control 70 percent of agricultural commodity trade worldwide. We've heard how much the supermarkets in the North, the main retailers, control markets. We tackle that ferociously in some national environments in the North. We're not even thinking about how to tackle it on the international level. We must do so in the next WTO round.

The third area I want to talk about is conflict. Only five weeks ago I was in a remote part of Angola watching people from Médicins Sans Frontières struggling, in vain, to keep alive some children who were severely malnourished. Without question, conflict in this world is interacting with other forces to cause some of the most severe malnutrition and infant mortality. We must take on that issue.

I would suggest one more issue regarding this problem: small arms. In northeast Kenya, the barter price for an AK-47 has gone down from 10 cows to 2 cows. In parts of Sudan, you can get an AK-47 for the price of a chicken. That is crazy. A lot of those arms come from northern countries, from big exporters who are not well controlled. We've got to get into marketing export controls, bartering, and end-use controls.

We've also got to hold some governments accountable when they don't look after their people. In Angola the government is moving people out of the way of UNITA, as is its right, and clearing areas for military purposes. The government can do that. What the government is failing to do and leaving to agencies—which in many cases can't get there—is provide food to those people.

We can't have the largest oil exporter outside OPEC not feeding millions of its people and asking agencies to pick up the tab. We should be morally outraged about that and put pressure on governments like that.

So I submit those three things to you: empowering women through girls' education, leveling the playing field in trade and agricultural markets, and tackling the trade and use of small arms that fuel conflict.

Mercy Karanja

Chief Executive, Kenya National Farmers Union*

I take this opportunity to thank IFPRI for its kind invitation to me as a representative of farmers—and not only farmers in Kenya, but in Africa. As we are very few in the conference (only 2 percent of the participants are representing farmers) I beg to differ with the priorities we are setting. I think priority number one is to involve the actors and producers more during our deliberations, otherwise it becomes an academic exercise without producers looking at the issues that cause food insecurity. If more producers were here, we would have gone home the first day.

Before I came, I had a meeting with producers and addressed to them the question: What is your biggest constraint? They said, "When you travel to Bonn, come back with results, with directions for marketing our produce and getting more resources to do our business—we are in business."

The producers are ready. They are working very hard, but they face two constraints: they cannot sell their surplus, and they do not have access to production resources.

When we talk about production resources, we are talking about many issues: land, water, finances, markets, and so on. We have heard a lot in the course of the last three days concerning land, especially the need to have a clear tenure system.

In Kenya where I come from, we have had a very good tenure system, which gives us title to land. For a while, we were able to take care of our land very well. Over time, however, because of our inheritance laws, we subdivided again and again for our children and children's children. As a result, we have housing estates instead of farms in the high-potential, rural areas of our country. This is happening in most of the Horn of Africa. There is more to the issue of land tenure than secure titles. In Kenya and many other African countries, when one has six sons and 1 hectare of land, the land is divided into six pieces so that every one of them can have a piece of land. We had very good presentations on the efficiency of small-scale farmers, but how small is small? And how far do we want to go in this subdivision?

As we discuss land tenure, let us keep in mind that we are talking about people living

In parts of Sudan, you can get an AK-47 for the price of a chicken.

* Summary note included in Appendix 3.

in the most productive areas of our countries. This means that the most productive land is being lost to housing. We need to reverse this trend!

Water is another production resource. In Kenya, for example, water scarcity is a problem. However, there is a lot of water that is not utilized. We should be able to use some of the low-rainfall areas to produce food for our people. Water should be better harnessed in these areas, and in areas where it is not available, we should find ways of getting water for agricultural production through affordable irrigation schemes. This is critical. Most of Africa is relying purely on weather to produce our food, which is a very risky system. It is important to acknowledge that risk and insist that some resources be applied in water provision.

Unless we free the African people from the sheer burden of high production costs, the continent cannot invest enough in agriculture and the circle of poverty cannot be broken.

Another production resource that farmers require is finance, and a lot of times we are not talking about money. This is a critical area in which we must move forward. Time and again the World Bank has said that it has money to lend. I am not sure whether, given their economies, the African states are able to borrow from the World Bank to invest in small-scale agriculture. Kenya did that in the 1980s. Kenya actually became self-sufficient in food production. We had farmer support institutions in place and food production was going very well.

Today, many African countries are not about to borrow again because of the debt burden. That poses a contradiction for farming. African small-scale farming is a way of life as well as a business. But when the World Bank says there is money to be lent, it is doubtful that our African governments have the capacity to borrow that money, let alone to put it in a nonperforming sector like small-scale farming.

Microfinancing is also available. But at the local level nobody wants to service agriculture, because it will not provide the returns needed to repay the loans. The issue of financing for farmers should be looked at differently than it is now. There has to be another way to support African agriculture, for example, by providing safety nets to producers if not subsidies.

The next issue that arises when we talk about production resources is biotechnology. Biotechnology has many confusing connotations. I want to reaffirm that the farmers are not against biotechnology. They are looking for solutions to their problems. In Kenya, we have blight-resistant potatoes, for which we are very grateful. The farmers in the developing countries are not very concerned with how this has come about. I must be very clear: if you can solve their problems, reduce their production costs, that would be welcome. And we are doing a lot of work in that direction.

Yet another production resource is information. As farmers ourselves, we are trying very hard to expose our fellow farmers to relevant information. With the collapse of the extension services, which were supported by the World Bank in the past, we have a big technology gap. Producers in the developing countries still need to know where to go for information and advice on available technology.

Finally, let us discuss what the farmers of the North and the farmers of the South can do together. Farmers in the South can learn from the long history of the farmers in the North. The farmers themselves need to be involved in these meetings so that they can interact better and get solutions from farmer to farmer.

We need to remember that the developed-country producers are highly protected to ensure that urban populations receive safe, affordable food, thus freeing up individual incomes for investments

other than food. Unless we free the African people from the sheer burden of high production costs, the continent cannot invest enough in agriculture and the circle of poverty cannot be broken.

Klaus Leisinger

Executive Director, Novartis Foundation for Sustainable Development

In the private sector, people very often look at things quite simply, so I see only three things that we have to do: first, good governance; second, improved constructive cooperation; third, research and development and transfer of technology.

The first point is good governance. The world's poor and hungry are suffering not so much from a lack of knowledge as from our insufficient political will and civil wisdom to implement what we know is right and has worked. Hence, the first priority for action is to implement what are known to be the politically and technically best practices.

Politically, the priority areas for implementation in the South are empowerment, participation, land and leasehold reforms, effective agricultural extension programs, and other educational programs for the small farmers and their families. In the North, the agriculture protectionism issue has been mentioned several times.

With regard to technical best practices, we should have an open portfolio, meaning that conventional breeding should continue wherever it makes sense, but governments and farmers should be open to biotechnology and genetic engineering where it offers advantages. In addition, a lot can be done with improved agricultural practices.

My second point has to do with improving constructive cooperation. Different actors in civil society have different concepts, skills, techniques, experiences, and resources in terms of both personnel and finance. They're also driven by different motives. Although there's a rationale for and natural division of labor and responsibility, synergies for unorthodox purposes are nevertheless feasible when different actors cooperate.

As a result of their differences of background and experience, these different actors are likely to analyze issues and appraise not only the problems but also the opportunities differently. This competition of ideas provides the substance and tension for new constructive development.

For example, food security is a multifaceted task involving different actors with differing roles and responsibilities. As such, it can only be achieved if and when those who have something to contribute to solutions do so in constructive cooperation with other relevant actors.

We will not likely see drastic increases in overseas development assistance. More money for agricultural development is even less likely. Therefore, we must increase the cost-effectiveness of development cooperation in agriculture and elsewhere. That means focusing on what organizations can do best, coordinating and cooperating to ensure that time and effort are not wasted on reinventing the wheel. This includes making the best use possible of public-private partnership opportunities, and here I have two specific points to make.

The world's poor and hungry are suffering not so much from a lack of knowledge as from our insufficient political will and civil wisdom to implement what we know is right and has worked.

Ian Johnson spoke about the new arrangements with the private sector. I'm very glad he said that. But I have seen the World Bank going many extra miles to accommodate to the demands of NGOs, and I wish they would be half as constructive toward the private sector.

Also with regard to public-private partnership opportunities, I do support calls on the private

sector to make available cutting-edge science results regardless of intellectual property rights for use in research for subsistence farmers. The private sector can provide much more than money; it can also offer cooperation agreements, licenses, and best practices in many areas.

Third, technology has been and will continue to be a powerful tool for human development and poverty reduction. Technology-supported advances usually provide not just one-time gains. Always, then, we should do our best to create more political and financial support for public research. Investments in the CGIAR have been shown to provide a particularly big bang for the buck. If we could use this opportunity of us all being together and ask for more money for the CGIAR and the national agricultural research systems, that would be a good thing to do.

Discussion

The discussion opened with the Chair asking participants to identify priorities for action. The question elicited a wide range of reactions from the audience, including the following suggestions for priorities:

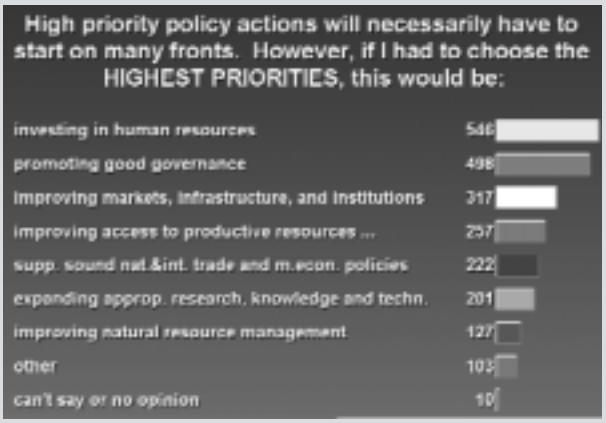
- *Good governance and political will.* Issues of good governance and political will dominated the discussion and were identified as the number one priority. Several points emerged from the discussions, including:
  - *Building political will as a program of action.* Farmers should be organized to speak for themselves, advocacy organizations should be built for researchers, and policy entrepreneurship should be encouraged by linking research with specific policy decisions. Research must be done with an eye to the actual policy process and disseminated to the advocacy groups or policymakers who are making decisions.
  - *Participation at all levels.* Tasks that seem impossible can be accomplished where there is participation and political involvement of people at all levels, so the future does belong to those who are organized. Most of these problems will only be solved by people working together.
  - *A strong lobby for hunger.* All the stakeholder groups should create a hunger lobby to address the lack of commitment to hunger issues. That lobby should involve informed advocacy efforts, with substantiating data on the magnitude of the problem. A strong and informed civil society is needed to create a strong lobby at the national level.
  - *Increased dialogue.* Those who work in agricultural and food knowledge systems should engage in more dialogue with the general public, opinion leaders, and policymakers. In the North a massive educational and awareness program is needed to help opinion leaders and policymakers understand the complex issues. Researchers can help them make wise decisions and allocate resources to help solve the problem of hunger.

  - *Starting at home.* Pressure can be organized from below to cause change. For the first time good governance seems to be something that everybody agrees on. It does not mean that one sits on the fence and shames and names others, but that we all have a reason to start at home.
  - *A common global advocacy.* It is so easy to divide us, but we are all trying to achieve largely the same outcome and that should bind us.
  - *Informed advocacy combined with political mobilization.* The greatest change happens when clear research is married to public, large-scale political mobilization. When advocates presented debt as a problem without substantiating data on the magnitude and debilitating aspects of the debt, they were easily dismissed. When the advocacy became informed, for example in the Jubilee 2000 campaign, it made the difference. The success of that campaign was also due to political pressure on the G-7 countries.
  - *Links with current targets.* It can be shown that food security programs are effective, and food security can be linked to international development targets to create political will. Current committed resources are bound to these targets.
  - *Community action.* The way to bring about good governance is through community action. Institutional arrangements should be developed so that governments improve.
  - *Conflict.* The elimination of conflict should be included under the priority of good governance.
  - *Building democracy.* Leaving the Conference with a recognition of the problem of hunger and poverty puts us on the right track for democracy. No functional democracy has ever been built on an empty stomach.
  - *Public hearings.* Transparent public hearings are important.
- *Quick fixes.* In addition to the priorities listed in the presentations, which are long-term investments in areas such as human resources, education, and training, there is a need for a quick fix, something that can work in the short term and can be listed as a priority.
- *Emergency relief and rehabilitation.* Projects that are classified as emergency relief and rehabilitation should be considered priorities. These projects do not just involve food aid, but saving lives and livelihoods. They include cash for work, seeds and tools, restocking or destocking food, and provision of water.
- *Technology.* Developing technology, such as biotechnology and genetic engineering, should be a priority. All too often, technology skepticism has prevailed in development circles, and this attitude is not fruitful for sustainable food security. Technology should be acknowledged as a positive factor.
- *Climate change.* Fulfilling the goals of the Kyoto Protocol must be a priority. For the sake of attaining a goal in the year 2020, we must not forget the obligation of the industrialized countries to work to set stronger goals than those in the Kyoto Protocol.

Long-term tasks cannot be forgotten in an effort to overcome short-term emergencies.

- *Nutritional empowerment.* Available resources should be used to reach better levels of nutrition. Research should be done on which traditional and culturally acceptable foods are high in nutritional value, as they are already available.
- *Capacity building in the South.* Capacity building should be a priority not only in the technical areas of agriculture, but also in the wider issues of public opinion, awareness, and policy. Building the capacity of farmers to take on more responsibility for achieving food security and rural development should also be a priority.
- *Spending money wisely.* It is more important to spend money wisely than to have a lot of money. After seeing how a lot of projects are working, a participant admitted feeling not that there is too little money, but that there is too much. Development assistance should learn from the successes of the private sector and use the concepts of competition, cost-effectiveness, working without subsidies, and maximizing returns. The return on investment in development assistance is not money, but there are returns, and one can maximize those.
- *Domestic marketing bottlenecks.* Ethiopia had a food surplus during the famine in 1984–85, and in the last three years that country has seen a tripling of maize yields and a complete collapse of the maize market. Now prices are below production costs. A focus should be put on market institutions to promote trust in markets, reduce transaction costs, and, most importantly, enable coping with risks.
- *Domestic policies that support agriculture.* Domestic policies should drive developing countries forward in agricultural productivity and domestic markets.
- *Safety nets.* Safety nets are needed for those households that are unable to benefit from long- or medium-term income-generating activities or from their own production.
- *Institutional arrangements.* The issues of institutions, governance, and the marketplace should be linked. One institutional issue is how to shape the marketplace to get the kind of national and global public goods that we need for our children and their children.
- *Agroecology and sustainable agriculture.*
- *Improving accessibility and infrastructure.*

Conference Opinion Poll*



**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

- *Making poverty reduction strategies work at a national level by engaging all actors.*
- *Postharvest management and processing as a means of increasing variety and value.*
- *Linking debt relief initiatives with questions of food security.*
- *Encouraging trade among developing countries.*
- *Financing developing countries to establish transportation facilities to guarantee the export of goods.*
- *Creating and maintaining institutions that support productivity.*

Many interventions during the discussion examined the roles of particular actors in working on the priorities. The points raised are summarized here:

- *Farmers.* A working group of top farmers from the developing countries should be formed to talk about and judge the issues discussed during the Conference and to follow up on the priorities identified.
- *Businesses.* Big business should be more involved in and supportive of hunger campaigns and poverty alleviation. Ten of the top businesspeople who are generous, who understand the issues, and who will understand the issues better because they are working with people like the participants at the Conference could make a difference.
- *The media.* The international media as an actor could help achieve identified priorities.
  - Finding enlightened media who are interested in these issues is not easy, but there are some, and we should work with them more. Over the past year many hunger- and development-related issues have been on the front page of the news—for example, foot and mouth disease, refugees, and GMOs. We should think about how to get mileage out of these stories.
  - The media could focus on linking hunger with the effects that food security problems have on developed countries. If good news from the research side is combined with people's own worries, people will see the link between food security and its secondary effects on their own lives.
- *Governments.* One of the most important steps a government can take is creating a level playing field and setting policies that will allow all actors to play a role in development.
- *Individuals.* One positive aspect of the Conference was that all the sectors were represented. The Conference should serve as example that all should see themselves as actors and as solution carriers, and it should set the stage for other meetings.

Following the comments, the Chair noted that a more thorough discussion on the roles and responsibilities of particular actors would take place in the following session.

In addition to discussing specific priorities for action, the participants debated how to set priorities. It was suggested that the Conference identify several key priorities instead of creating an exhaustive list. If the list of priorities is too long, how many real priorities get diluted? One participant asked, how do we get the priorities to become a priority? Another stated that individual countries must put priorities within the

priorities. Ian Johnson added that the priorities are interconnected and that there is an intertemporal dimension. For example, dealing with conflict issues is the highest priority in areas and countries where there is conflict. Much depends on the specific situation in a country.

When the Chair asked the audience what effective, practical steps would help build momentum behind the priorities for reducing hunger and solving problems of food security, a participant responded that operationalizing the priorities requires making them more specific. It is not useful to cast them in such a general way. "Poor," "hungry," "agriculture"—none of these nouns is mentioned in the list of priorities. Throughout the Conference, the participant continued, people have said that macroeconomic policies must take into account the priorities within the community and the interests of the poor, of the hungry, of the rural. The governance of international trade is linked to the governance of the international economic system. These links should be cast in the priorities. More specific priorities can help to define next steps. The Chair added in response that the listed priorities are simply headings, and it is the priorities included under the headings that can be operationalized.

One topic that provoked thorough discussion by the panelists came up when a participant asked about the impacts of the protests in Seattle and Genoa on the agenda of trade negotiations and discussions. Klaus Leisinger responded that there is a need to cooperate, talk to one another, and respect one another, so that good things can be accomplished in a constructive manner. Evaluating and analyzing the factors of success in positive case studies and relaying that information to others can help build other successes. Mercy Karanja agreed that showing what is possible and what should be continued is a good strategy. Stewart Wallis commented that events in Genoa and Seattle have altered the dialogue and the future of the WTO and that the comments from the incoming director during this Conference reflect that realization. The difficulty is that many of the problems about which people are protesting will not be solved by improving market access and removing subsidies. The power imbalances in markets are far too big and will need wider, long-term solutions. Mechanisms of global governance and political participation are vital in solving those problems. Johnson responded that it is a profound movement, and it must be listened to. He believed people power will prevail on many of these issues. The movement is calling for global equity and a more level playing field, in the WTO and in the globalized world, where the vulnerable are feeling more vulnerable and where cultures are being attacked and replaced by a globalized culture. These are very real issues, and the new institutional framework is, in a way, on the streets. The movement is positive in that stakeholders are voicing their views and being connected across the world. Johnson expressed hope that the violence of the minority would not obstruct the achievements of this movement.

Toward the closing of the session, an electronic vote was taken to ask participants to rank the priorities listed in the draft 2020 document. The Chair, Keith Bezanson, summarized

the results of the vote, stating that they are not intended to be definitive but only indicative. Nor do they suggest that there are not huge interrelationships between priorities. Based on the results of the vote, the first priority would be building human capabilities. It would involve education, women, health, and eliminating the risks of AIDS, for instance. The second priority, only very slightly behind the first priority, would be good governance. It would involve not only national governance but also international governance and accountability of both national and transnational organizations. It would entail the rule of law, the articulation and enforcement of rights, the strengthening of public goods, and support of poverty reduction and hunger alleviation, among other things. The third priority would be making markets work for the poor, putting infrastructure in place, including rural infrastructure, building institutions, and removing barriers and subsidies or subsidizing where appropriate.

Chapter 23

Whose Responsibility Is It to End Hunger?

Chair: Joachim von Braun
Director of the Centre for Development Research, ZEF-Bonn

We have an unfinished agenda. We have a pretty clear idea of what should top the list of priorities, but only a few suggestions of how to get organized to move from vision to action. This session therefore asks, Whose responsibility is it to end hunger? The point is not to assign responsibilities but to ask who—which types of organizations and which actors—can do what is best under what conditions to reduce food insecurity.

In doing so, we should maintain some historical perspective. We cannot shy away from pointing out irresponsibilities, inexcusable negligence, and liabilities that have produced hunger in the past. We cannot pretend that history starts today, and we are now mobilized to end hunger. Violent alternatives exist to address the hunger issue and have been used in the past. The poor and hungry have risen up in revolutionary and violent actions to address their misery. That is the history of Europe and elsewhere.

Introduction: Robert Paarlberg

Professor of Political Science, Wellesley College and Associate at the Weatherhead Center for International Affairs, Harvard University*

Who should act in complex global-problem-solving circumstances? One appropriate starting place might be the advice offered by Rene Dubos, the French-born microbiologist who gave us the phrase, "Think globally, act locally." This might be one action strategy we could embrace for global food security. It made a certain amount of sense from his vantage point as someone concerned with international environmental issues. For example, consider the problem of climate change. We have to think globally about climate change because the endangered atmosphere is a single global system that we all share. But we have to take separate local actions because the contributions to the greenhouse gas buildup differ from one country to the next. In one country it may be underpriced gasoline, in another it may be dirty coal-fired powerplants, or in some other areas it may be deforestation. Think globally, act locally.

This motto is useful for some kinds of global problems. But the problem of ending hunger is a bit different. The food entitlement systems that are breaking down and leaving people hungry today are mostly local systems not global systems. In Africa, where hunger is now on the rise, the problem does not stem from a global food production failure, or even from a developing country food production failure. If you look at the developing countries as a whole over the last 30 years, per capita food production has increased by more than 50 percent. The food production failure in Africa is specific to Africa. In the last 30 years, Sub-Saharan Africa has seen its per capita food production decrease by 9 percent. This is not a global failure; it is localized in one region.

Other kinds of hunger-causing food entitlement failures are also usually local in nature. They can result from legal or social status differences within local communities—between different racial or ethnic

* Summary note included in Appendix 3.

or religious groups, between men and women, and between high caste and low caste, or landed and landless people within the same community. These are local social-status differences that generate hunger for one group and not the other. They are local problems, not global problems. Food entitlement failures can also result from localized droughts, localized outbreaks of violent conflict, and localized governance failures. So hunger today tends to be generated by many different circumstances, yet these are more often local than global. In the United States some years ago, a politician from Boston, named Tip O'Neill, made the comment, "All politics is local." That was an exaggeration, but it communicated an important truth. It would also communicate an important truth if we learned to say that "most hunger is local."

Because the causes of hunger are so often local, thinking globally about this problem can actually be misleading. If we think globally about the problem, we end up worrying too much, for example, about the price of the food on the world market. The world food market is mostly used by rich countries, and it should not be our first reference point for learning about food circumstances in poor countries. The poor countries with the largest numbers of hungry people have actually made it their policy not to depend upon the world market. The countries of South Asia, where hunger is still widespread, nonetheless follow a policy of importing only about 2 percent of their total grain consumption from the world market.

When poor countries do import from the world market, the fact that the market may be in surplus, which it usually is, or the fact that there's a low price on the world market doesn't mean that hungry people living in remote rural areas within those poor countries will ever see low-priced food. Because of poor rural roads, inadequate infrastructure, and high transport costs, many hungry rural communities in the developing world don't really have access to the low-priced food that exists on the world market. Many of them are poorly connected (in terms of infrastructure) even to their own national food markets, let alone to the world food market. To address hunger issues properly, we need to think locally, rather than globally, most of the time.

How then should we act? After thinking locally, should we then try to act locally as well? This is a natural and logical urge that has been embraced by large numbers of grassroots NGOs. Unfortunately this approach has limits. Grassroots organizations usually have meager financial resources, and some local needs, like the construction of adequate rural power and transport infrastructures, can be quite expensive. In addition, this local grassroots NGO strategy tends to be limited by what state authorities will accept. State authorities may not want to make land ownership more equitable. They may not want to give priority to family planning assistance or to secondary education for girls or to property rights for women. Or they may not want to permit the formation of truly independent farmers' organizations or marketing cooperatives. If so, grassroots organizations may be significantly limited in what they can achieve working locally. National governmental policy, more often than not, is the key.

In today's world, in spite of globalization, the official institutions of nation states usually remain dominant within their own territories. Because national governments still have an exclusive claim of sovereign authority, NGOs, donors, and even powerful international financial institutions such as the World Bank have difficulty taking the local actions needed to end hunger. The key local initiatives first must be taken by the national governments in question. The World Bank and the IMF have a reputation for being able to coerce national governments in the developing world into changing their policies at will, but that's not the way I read the experience of the last 20 years. The World Bank has loaned out billions of dollars to developing countries hoping to secure policy reforms—what it calls structur-

...if we have a governance deficit today, it is at the national level not the global level.

al adjustment. But in Africa in particular, many of the prescribed policy reforms were done only partly, only temporarily, or scarcely at all. Sovereign governments have mostly continued to do whatever they have wanted to do. I fault the World Bank for having persisted so long with this flawed structural adjustment lending strategy in Africa; the Bank would have had much more to show for its lending in Africa if it had used the money not to rent policy reforms that are reversible, but to finance tangible investments in roads, schools, clinics, human resources, and research.

That is not to say that everything can be done by national governments. Some things only global institutions can achieve, some things only global initiatives can accomplish. We need a capable, global famine early warning system; we need a capable international food aid delivery system; we need a capable international agricultural research system. But in fact we already have these things in place. Our international famine early warning system and our food aid system work quite well, except in those instances where cooperation from national governments is missing as in the recent famine in North Korea, or in cases where violent conflicts break out locally. Our international agricultural research system works quite well except in those cases where national governments let it down. Donor governments (such as the United States) have failed the international research system by cutting back sharply on funding over the last decade. And some governments in the developing world have failed the international system by not investing adequately in their own parallel national agricultural systems and extension services. Thus, if we have a governance deficit today, it is at the national level not the global level.

I'll sum up by offering my own suggestion for an appropriate bumper sticker phrase for ending world hunger—an alternative phrase to Rene Dubos'. Rather than "Think globally, act locally" I would say "Think locally, act nationally."

Rather than "Think globally, act locally" I would say "Think locally, act nationally."

Klemens van de Sand

Assistant President, Project Management Department, International Fund for Agricultural Development (IFAD)

We have heard that national governments have the primary responsibility for ending hunger by providing public goods. The obvious questions are, Why don't they provide those goods? and Why don't they take that responsibility? My thesis is that we lack political will and commitment, and that is more important than a lack of capacity and economic resources to fight hunger.

How do we create political will? I want to develop four propositions. First, political will does not come from heaven or from summits or, I'm afraid, from international conferences. It is driven by pressure from below—it must derive from those who are poor and hungry. Second, to build up pressure, the poor must organize themselves and be enabled to build institutions that serve them. Third, collective empowerment of the poor requires new political initiatives and new partnerships between national and international stakeholders. And fourth, these partnerships must be based on a profound refoundation of development policy centered on restoring dignity and rights to poor people in such a way that the poor become citizens.

Let me elaborate on these propositions, which I think might help to reformulate the priorities. The poor individuals and communities who are hungry are the ones who have the need and the will to fight hunger. Ultimately, the decisions to undertake the action required to put food in the pot and to improve the quantity and the quality of that food rest with households. In the majority of settings that means the decisions rest with women. The rural poor are usually ingenious and hardworking, but they remain poor because of, to paraphrase IFAD's poverty report, a lack of access to assets, to institutions serving and promoting their needs, to markets that do not militate against them, and to knowledge, technologies, and inputs to produce and process food.

Thus, the poor need access to material assis-

tance. But they will not get that access unless they have greater influence over the national and local institutions that distribute access. That is why reducing hunger requires empowering the poor. They have to be able to develop their own institutions serving their own interests. They have to be able to influence other institutions in political and economic bargaining, and their interests must be represented in policy development. Empowerment and more resources will reduce hunger. Resources without empowerment are not the answer.

Empowerment means many things: farmers' associations, water users' groups, locally based savings and credits organizations, self-empowered women's organizations, and democracy at the local and national levels. Governments are likely to take an active part in fighting hunger when they are under pressure from the majority of the people. The task is to mobilize and organize that majority. Paradoxically, it may be easier to organize that majority in developing countries than in developed countries—where it is also our task—because in developing countries, the poor are the majority.

...we lack political will and commitment, and that is more important than a lack of capacity and economic resources to fight hunger.

In short, the focus is on institutional change through representative institutions. Poor communities can influence will and commitment. They can promote good governance. And they are the ones who will set the right priorities. Let's not worry too much about setting one, two, three, four, five, six, seven priorities. Let the poor make those decisions.

Then what is the responsibility of international partners and the donor community? It is basically to enable the enablers. International development partners must forge a new deal to correct fundamental trade distortions and provide more assistance, especially assistance to governments to provide public goods like roads and schools in rural areas. Above all, assistance has to be more balanced in order to transform public goods into people's goods. The words are all there—empowerment, decentralization, capacity building, governance—but the deeds are still lacking.

Both the concept and the reality of cooperation have to change. Assistance must always and only be provided within the framework of assisting the self-organization of the poor, creating greater political and institutional accountability to the poor, and focusing resources in areas that the poor themselves consider critical for their livelihoods. There is hope for such a new concept and partnership in development. We all have to have hope. Having worked in development cooperation for more than 25 years, my experience is that if you do not have hope anymore, you should leave the field of development cooperation immediately.

I would like to highlight three initiatives and approaches that may show the road ahead. First, we need to strengthen the organizations of the poor. All IFAD projects have community development components that try to strengthen these organizations, particularly of women and marginal groups. IFAD is not the only organization pursuing this approach. Many other agencies and even more NGOs follow the same road, and some are ahead of us.

The second point is about poverty reduction strategies. This Conference is a central policy forum at the international level for making a difference toward pro-poor investment and pro-poor policy. We have an urgent task here, to come up with a strong request to governments that they bear the onus of the poverty reduction strategy. We need an even stronger request to the World Bank, the IMF, and the other drivers of this political process, namely that they incorporate agriculture and food security into the poverty reduction strategy agenda and include ministers of agriculture and social

development as well as representatives of rural communities around the negotiation table. So far, these politically "weaker" stakeholders are—in many cases—not yet included in the development of poverty reduction strategies. Only the "strong" partners of the "strong" agencies sit around that table, namely planning and finance ministries. But they may not reflect the interests of the poor and the interests of development policy—and that is not only the case in developing countries.

Third, we need to forge alliances among international agencies to get agricultural and food policy back on track. The time has arrived for change. Nationally, governments are beginning to see a way to a different concept of growth and poverty reduction. We have been called to watch South Africa in this respect and should add Uganda, Ghana, and certainly Nigeria and others. International partners are ready to help these examples become the rule rather than the exception. One alliance worth noting is the new strategic partnership between IFAD and the Rural Development Department of the World Bank, recently initiated by the Presidents of the two institutions. Here again, the key may be empowerment—but in this case, it is empowerment of a "minority group" in the World Bank in order to correct the trend of diminishing funds for agriculture and rural development.

There are other like-minded partners. For example, the UK's Department for International Development, CARE with its Sustainable Livelihood Approaches, FAO, and UNDP are all endeavoring to develop a rights-based development approach. The German government recently adopted an action program for poverty alleviation in which fighting hunger figures prominently. And having listened to Minister Wieczorek-Zeul, we can all be confident that this will translate into more resources for agriculture, food security, and agricultural research.

My final point is on a human rights approach to fighting hunger and poverty. Human rights should form the bottom line of the political initiatives President Johannes Rau called for. But there is not only an interdependence among human rights, there is a hierarchy: civil and political rights are the foundation of social and economic rights. The right to food cannot be secured sustainably where the poor and hungry are not free to speak out against corruption and mismanagement, where mass media are not allowed to criticize anti-poor agricultural policies, where poor farmers and workers are not free to form associations, and where land tenure and inheritance laws discriminate against women.

Let us be bold: if we want to achieve food security for all, we must join hands with the poor in their quest to become citizens, citizens in democratic states.

...political will does not come from heaven or from summits.

Julian Gonsalves

Former Vice President for Program,
International Institute for Rural Reconstruction

Now that the rhetoric of hunger and malnutrition and the poor has entered the mainstream, I hope that we have a new understanding of the context of hunger. Not only do we need to answer the question of who is responsible for ending hunger, we also need to know who is responsible for us not being able to end hunger. Those are large questions. I want to be practical and simply share three examples of research partnerships and how they have contributed to the alleviation of poverty.

First is the example of national agricultural research systems in India. With the support of IRRI, IFAD, and several agricultural universities, researchers were able to transform rainfed agriculture in Eastern India. The single major increase in rice production in India in the last six years has come from rainfed marginal lands, and that is in the range of 6 to 11 million metric tons per year. What is interesting is that the increase per hectare is only 0.38 tons, but since that happened on more than 21 million hectares of land, it had a significant impact. Thus a huge opportunity lies in marginal rainfed areas throughout the world for introducing

genuine partnership-based approaches.

Another example involves partnerships between research institutions and NGOs, such as in Bangladesh where women have been able to access water resources. International Center for Living Aquatic Resources Management (ICLARM) works in these project sites with about 19 NGOs. This partnership expects to supply 22,000 metric tons of fish every year, valued at about $17 million a year and enough to feed 1.8 million people. These institutional arrangements that allow access to common property resources help hundreds of thousands of women take advantage of scientific breakthroughs. Involving NGOs in this case has contributed greatly to the scale of the achievement.

Not only do we need to answer the question of who is responsible for ending hunger, we also need to know who is responsible for us not being able to end hunger.

Urban gardens in Cuba today produce 60 percent of all the vegetables consumed in that country, and that is about 70 percent of what FAO recommends for an individual's daily intake of vegetables. Cuban agriculture rose from abandoned lots to become the largest urban agricultural movement in the Americas.

What is most impressive is that this change has happened in the last 10 years. Urban gardening requires imaginative policies by national and local governments to allow access to unused land in cities. (Oxfam America has more information on the subject.)

There are other forgotten stakeholders and a huge amount of knowledge that remains on the shelf, underutilized. Development workers have often argued that as much emphasis needs to be placed on research utilization as on research generation. The emphasis on the research and development paradigm proposed and implemented by the International Centre for Research in Agroforestry (ICRAF) might change the situation. Unlike many other institutions that only look at research components, ICRAF attempts to relate its research mission to the development agenda and that makes it unique (among research institutions). Governments, donors, and civil society must insist on this paradigm of doing research differently. Otherwise we will continuously see yield gaps. The divide between research and development has too long shielded scientists from being accountable to farmers and civil society.

One significant problem, not often mentioned, is the loss of the "frontliner." Many extension systems have been dismantled or privatized, and—unfortunately or fortunately depending on your viewpoint—civil society has been forced to assume a bigger role as watchdog. Indeed, that has become an essential role in an increasingly globalized and complex world. Now civil society must press governments to make appropriate rules governing the market. Civil society pressed the private sector to make technology available to the poor in the case of medicines. Why not do the same in the case of agriculture? Across the world civil society is moving away from technology and technician-led strategies to farmer-led and people-centered approaches. These are more cost-effective approaches, but they are going to require policy support. Farmer to farmer approaches must focus on reaching the masses. The strength in farmers' capacities to continue to innovate helps them cope with change—which we have a lot of these days—and make continuous adaptations.

My next point concerns the value and importance of local institutions. Local institutions that are accountable to the majority will help us better address the basic causes of poverty. Given the problem of differential access to resources, local institutions can

help us gain access to those resources. Accountable and representative local institutions must be at the core of any program to address poverty and hunger. Donors and governments must advocate for strong local institutions even if decisionmaking becomes more complicated as a result of the increased role of the poor.

It is increasingly apparent that whoever controls the inputs and outputs of agricultural research tends to benefit the most. Can we honestly say that the bulk of research goes to issues that benefit the poor? Can we honestly say that farmers are more in control? Let's answer that question objectively. Where is control vested? When people's choices are increasingly limited, and control is increasingly vested in external entities, the right of the farmer has been violated.

So what does it take to bring a change not only in mission statements but also in the work being conducted in the labs and in the farmers' fields? The public sector must make the shift and exert the preferential option for the poor, both in budgets and in the allocation of staff resources. The second Green Revolution led by publicly funded research and development institutions and their partners in the private sector and civil society will deliver on the goals only if they focus on marginal areas and recognize the centrality of stakeholders living in those remote, complex, diverse environments.

We need that new and broader understanding of the context of hunger today if we are to succeed this time around.

Usha Barwale Zehr

Joint Director of Research, Mahyco (Maharashtra Hybrid Seeds Co., Ltd.)

I want to begin by relating a story that appeared in one of the Indian newspapers recently. A petition related to the availability of food for the hungry had been filed in the Supreme Court of India. The Supreme Court, after reviewing all the documents, released a statement urging national and local governments to take appropriate action. The newspaper put it this way: "Expressing serious concern over the starvation deaths in some states, the Supreme Court ruled that it was the primary responsibility of the central and state governments to ensure that food grains were reaching the starving people." The Supreme Court also noted that major schemes without implementation were not sufficient. Food should reach the poor even if it had to be given away for free. The third point the Supreme Court made was that no person should be deprived of food merely because he or she had no money, thus establishing the fundamental right of an individual to food.

This newspaper article seemed like a good starting point because it highlights three main points that I want to discuss. First, fighting hunger is the responsibility of the central and state governments. Second, if necessary, food should be given away for free by governments to needy people. Third, there is a fundamental right to food. After reading the article, you might think that the responsibility lies only with the governments, and governments must take the necessary action to remove hunger. Unfortunately, the realities on the ground don't always reflect what governments actually require of themselves, or actually do.

Next to this article in the newspaper appeared a cartoon. It said, "Neither the central nor the state governments acknowledge any starvation deaths. The closest they admit to is deaths on the account of chronic malnutrition." It went on to list a number of schemes that are in place to address the needs of the hungry or the poor. Clearly, something is not right. There are many schemes, but they are not being implemented. The cartoon depicts very clearly that ample food is available in India at this moment—we have buffer stocks. However, India still has the largest number of malnourished people. So, to my mind, distribution of food is the first, urgent responsibility of the governments as a short-term solution to meet immediate needs. The responsibility of the central government remains,

Accountable and representative local institutions must be at the core of any program to address poverty and hunger.

but the Supreme Court has very clearly stated it is not just the responsibility of the central government but also the responsibility of the state government.

One recently published study "Food Insecurity Atlas of Rural India," produced by the World Food Programme and the M.S. Swaminathan Foundation, clearly shows that national level policies don't necessarily apply to all the states and that different needs exist in the different states. Thus, in addressing poverty or hunger, we must look at the requirements at the state level or even go down further to local needs. Some states may require polices that relate to water, while other states may have policy or research requirements in terms of productivity. In other states, it may be infrastructure. Thus national-level action is not enough. We must look at the state requirements, and proceed from there.

...fighting hunger is the responsibility of the central and state governments.

The distribution of food to meet immediate requirements is a short-term solution, not a long-term sustainable solution. Therefore, I will focus on productivity per person as a long-term solution. The atlas provides state information that clearly indicates that productivity per person varies by state, and the reasons for low productivity often depend on the specific conditions the person faces in that particular environment. Thus, we must gather information—through biological research, social research, or physical research—to determine what the requirements are at the state level. Gathering of the information could be an institutional responsibility, whether local or international. When the information is in hand, it becomes the responsibility of the local governments to take necessary action with assistance from all—local government, central government, and international agencies—as required.

My third point relates to the current environment that we work in, which is changing. Coming from a private sector company in India, I would do a disservice to my community if I did not mention the roles of the private sector. The roles of the public and private sectors in India overlap and thus get blurred. We are in a transition period where it is essential to establish full confidence between the two sectors. The private sector is technologically strong and is willing to provide necessary support and information. To look at long-term sustainability for food security, we must form new partnerships, whether between the public and private sectors or between foundations and national/international agencies in order to solve problems starting at the village level. In all of this the efforts must begin at the local level supported by the regional or state governments, and, in turn, supported by the national and central governments.

In conclusion, I want to go back to the comment that to tackle hunger we must get better information about what the reasons are for hunger at the local level. With this knowledge, we can empower people in the problem areas to tackle hunger and poverty with the necessary support.

Harris Mule

Executive Director, Top Investment and Management Services, and former Permanent Secretary in the Ministry of Finance, Kenya

All of us, either as consumers or producers of food, are interested in food. So all of us are responsible for food security and ending hunger. There is a beautiful English saying that "everybody's business is nobody's business." Saying that all of us are responsible for ending hunger will not get us very far. We have to delineate the roles of the different players in the eradication of hunger.

My perspective is that of somebody coming from a least-developed country and region of the world where hunger is an increasing problem. If the central problem of addressing hunger is to increase agricultural productivity and improve rural development, and if we are really interested in addressing hunger, then we must improve the productivity of the smallholder and the rural poor. That means the person most responsible for addressing hunger and poverty is the small-scale farmer himself or herself. The small-scale farmer is the beneficiary of increased productivity, and therefore he or she is responsible first and foremost for eradicating hunger by increasing output through increased productivity.

The biggest problem is that the small-scale farmer is terribly disempowered. Therefore, the challenge for all of us, since we are all responsible for addressing the problem of hunger, is to empower. In the experience of my own country, the only institution that can address the problem of the small-scale farmer is the government. Therefore, government holds the key. Although, in the past, government has often been the central problem, it is nonetheless the key to eradicating hunger. The national government can ensure peace, can prevent conflict. It is responsible for the policy environment, for law and order, and for regulations. And it is the institution that establishes the framework within which the private sector and civil society operate. Thus, the national government has the central responsibility of empowering the farmer to eradicate hunger.

Perhaps an even bigger challenge is that the national governments themselves are disempowered in the least-developed countries. They don't have the natural resources, and, in many cases, they don't have the capacity or the political will. It is the responsibility of the citizens of these countries to require that their governments demonstrate the political will, institute "good policies," and create institutions that will empower the peasant farmer. Equally important, governments must strengthen their capacities. It is easy to say governments should do a, b, c, and d. But the governments of the poor countries, in many cases, do not have the human or institutional capacities to undertake these measures.

Saying that all of us are responsible for ending hunger will not get us very far.

The governments themselves have been disempowered by the international political and economic environment. The list of problems is a long one: the globalization process, unequal power in the international arena, the problems of agriculture, the problems of the WTO, the problems of international finance, credit, and debt, and the problems of transfer of technology. In Africa, the reforms undertaken in the last 10 years have, in many cases, actually disempowered the state by eliminating and weakening development institutions.

All of these problems, and the many reactions to them, have created weak states. To strengthen the states so that they, in turn, can empower the farmers, the international community has a responsibility to: (1) create a level playing field; (2) reform WTO; (3) increase official development assistance; (4) ensure that official development assistance is usable and not tangled up in counterproductive conditionalities; and (5) look at globalization in the context of the original UN charter, which promotes cooperation rather than competition. International competition in a globalized context is advantageous to the powerful, but deleterious to the weak.

The private sector has a role to play. From my own experience in Kenya, linkages between small-scale farmers and multinational corporations have been very useful in the marketing of horticulture, which is supposed to be very difficult, and flowers. The private sector in Kenya has also contributed to building relations with our agricul-

tural research institute. So there is hope for the participation of the private sector in helping to eradicate hunger.

And one final point: civil society is terribly important. At the local level civil society can help raise the voices of the poor in the political process. The NGOs involved in direct assistance to poor farmers, including the provision of microfinance, and those at the international level have been very useful in highlighting the inequities and the prominence of hunger.

Discussion

The discussion session opened with an electronic vote on whether food security for all can be achieved by the year 2020, and nearly 50 percent of the Conference participants voted that it can. The moderator referred to the electronic vote taken during the first day of the Conference on whether food security for all will be achieved by 2020, when only 12 percent of the participants had voted affirmatively.

The Chair, Joachim von Braun, asked the audience to address whether the right actors had been identified. Participants offered a number of comments, which have been grouped by the following key actors:

- *Farmers.* Farmers must be on board. They should be organized and empowered to become the central point. Partnerships can then work within that environment, but with a focus on the farmers.
- *The donor community.* Although international organizations are included on the list of actors, the donor community should be more explicitly present. If the donor community reduces funds for agricultural research, even at a low level, it will be impossible to fulfill the goal of ending hunger.
- *Researchers and scientific organizations.* There is reason to be optimistic, because the Green Revolution achieved much, and the CGIAR now has a new vision and two-pronged strategy. One strategy is to continue the successes achieved, and the other is to target the very poor. Poverty-oriented strategies recognize that the poor are in difficult environments, both institutionally and biophysically. With agroecological, conventional, and biotechnology approaches, it should be possible to overcome problems of the physical environment. There are now also examples of how to succeed from a social perspective—for instance by involving farmers themselves in research planning, technology generation, and delivery. Researchers must still find out who the poor are, where they are, and why and how they can be helped out of poverty, and they must tailor approaches to the unique conditions of the poor.
- *National governments.* The problem of solving hunger lies mostly with the national governments. National governments, however, have used food to exploit the poor, whereas a solution requires empowering the poor. The international community has a role to play in supporting national governments in their efforts to help the poor.

Conference Opinion Poll*

**Using a digital instant voting system, conference participants expressed their views on a number of issues.*

- *NGOs.* During his closing remarks, Julian Gonsalves noted there is no doubt that NGOs today are viewed as a force. In the preparatory meetings for the World Food Summit, NGOs showed overwhelming interest, and many paid their own way to attend. Slightly apart from NGOs are small-farmer organizations, and this distinction is requiring NGOs to change their own roles to act more as a support system. Gonsalves expressed concern over polarization, noting that successful partnerships between NGOs and research establishments, whether national or international, have not been achieved. NGOs can help increase the uptake of technologies generated by research institutions. Although NGOs are perceived as extension arms or disseminators, they can play a much larger role in research and development as well. Today's new understanding of hunger involves social, political, and cultural issues that are often viewed as outside the realm of what research institutions ought to do, and this view might further polarize research institutions and NGOs. NGOs are increasingly spending time on advocacy, which is indeed a priority, but which unfortunately takes time away from action in the field.
- *The private sector.* According to Usha Barwale Zehr in her closing remarks, one can look at the private sector from two different angles: a humanitarian angle and a commercial angle. From the humanitarian angle, the private sector is made up of people, and people are generally concerned about the well-being of others, so that gives them an incentive to try to achieve hunger-free status. From a commercial angle, as sustainable hunger-free status is achieved, more purchasing power lies in the hands of people who could be future customers. Moreover, the private sector has begun to create

not-for-profit foundations that address issues related to poverty, malnutrition, and hunger.

- *The media.* The media has a tremendous role to play in raising awareness. The information reported should be factual, balanced, and responsible.
- *Public opinion.* Public opinion is key to the issue of climate change, argued a participant. Very few countries are responsible for the horrific situation that is likely to occur in Africa within the next 50 years. Who is responsible within those countries? In direct terms, it is public opinion; everybody is responsible. In indirect terms, civil society, not the central government, is responsible for changing public opinion. This participant asked, if we do not firmly attach responsibility to climate change, have we washed our hands of the responsibility? We ought to put the responsibility back on public opinion.
- *Partnerships.* NGOs and oil companies are working together to solve problems in natural resource management. If those disparate partners can do it, partners in agriculture, such as scientists, farmers, governments, the private sector, and NGOs, can do it. They could not only undertake research, but also formulate policy proposals for governments. They could develop markets, do advocacy work, and fund extension services, livestock services, and seed production. The World Bank's Development Gateway website was mentioned as a way to bring the community together and continue the dialogue.
- *Shared responsibility.* Is there any doubt that ending hunger is the responsibility of everyone? We all have a stake and a responsibility. The question should be, in the list of actors, who should come first? Another participant raised the fact that programs are prioritized because there is a budget constraint. There is no budget constraint on responsibility, so there is no need to prioritize. According to this participant, the way to look at it is: how can I, with the group I work with or with the institution or civil society of which I am a member, achieve the goal of ending hunger? What resources can each of us bring to our social and work networks, and how can we use those most effectively? Each of us has some responsibility, and each of us can use it in a different way. It was also pointed out that although everyone is responsible for hunger eradication, some are more equal than others. Certain critical partners, especially the state and the international community, must play their role before the rest can become effective.

An extended discussion also took place on the development of an index. A participant suggested that IFPRI help develop criteria or indexes for measuring performance in reducing food insecurity. It would benefit countries to exchange information based on accepted indexes instead of the different ones that are now used by different agencies. Another participant proposed an index that shows the food security status of each country each year so it is clear whether all of the responsible players performed well. This participant observed that the experience following the World Food Summit suggests that five years is far too long to wait for review, especially for advocacy efforts and lobbying at national, regional, or interna-

tional discussions. IFPRI was asked to consider developing an annual food security index. In his closing remarks, Robert Paarlberg noted that if the goal is to stimulate larger investments by national governments in food security-related activities, financed by donors or not, one useful index might be the percentage of the state budget devoted each year to areas such as agricultural rural development, rural infrastructure, clinics, and schools. As a percentage measure, this index would be fair even for small countries. The data so far suggest that most African governments, for example, devote only about 5 percent of the state budget to agricultural rural development, even though two-thirds of all the people may live in the countryside and depend on agriculture for income and employment, even though food production per capita may be falling, and even though hunger may be rising. If these data were tracked in a systematic way, there are some governments whose feet might be better held to the fire. A measure of the performance of international financial institutions could be included as well. Paarlberg thought IFPRI or someone else could undertake this task, and reminded the audience that Ian Johnson had mentioned earlier in the day that the World Bank's agricultural and rural development portfolio is now only 7 percent of the total. The United States Agency for International Development's (USAID's) agricultural and rural development portfolio is only about 10 percent of its budget. Paarlberg found these figures embarrassing and suggested that making these numbers more widely available would be useful for publicizing how neglected the priorities really are. In his closing statement, Harris Mule agreed that such an index is important and useful and that it can be linked to budgets for agricultural and rural development and human development. The taxation of agriculture and the negative terms of trade can also be added to the index.

Another topic of discussion was implementation by actors in the field. A participant raised a question to Klemens van de Sand on the implementation of strategies, using the example of Ethiopia. Ethiopia has designed many strategies and programs—the national conservation strategy, the regional cooperation strategy, the national action program for desertification, the national and regional forestry action program, and the regional food security program strategy. None of these programs is being implemented. Ethiopia is now in the process of designing another strategy, the poverty reduction strategy, and the participant expressed doubt about whether it will ever be implemented. Although van de Sand could not say why these strategies have not been implemented in Ethiopia specifically, generally the problem is too little funding, which reflects the lack of attention many donors give to agriculture and the resistance of donor-country parliaments and public opinion to investments in poverty reduction strategies if the developing countries themselves are spending money on arms and defense but not education and agriculture.

A participant brought up the rights-based approach to hunger. Conference participants should use their influence to change the language of food security from a needs-based language to a rights-based language. By changing the language, the participant noted, we

change how we think about the problem and how we deal with it. People have the right to food, and although rights cannot be fulfilled by other people—people have to fulfill their own rights—we need to help create an atmosphere where people can do so. If we continue to look at food security as a need that we can fulfill from the outside, we will never find a sustainable solution.

The issue of conditionalities was discussed. A participant raised the fact that although national governments have a responsibility to support the poor, international partners must also come in to provide resources and other support to national governments to help them support the poor. This participant found that structural adjustment programs and such conditionalities are not useful in solving the problems of the poor and wondered how to do away with conditionalities so that national governments, particularly in developing countries, can domesticate the agenda of eliminating hunger. In response, van de Sand asked, what about making human rights as a basis for conditionalities? There is not only an interdependence of human rights; there is a hierarchy of human rights. Civil and political rights are the foundation of economic and social rights. If people are not free to criticize their governments, if media are not free to take up corruption and mismanagement, if people are not free to associate themselves with others, if land and inheritance laws discriminate against women, discourse on a rights-based approach to food security becomes very hollow. We must reject the fact that the right to development was reduced to the right of development aid after the Vienna Conference. We can measure progress toward the fulfillment of human rights, van de Sand continued, using good and powerful indicators. Documents on food security for all should clearly spell out that we must join hands with the poor in the quest to become citizens with human rights. Mule agreed and added that conditionalities are inevitable when a donor gives funding, because the donor expects something in return. Good performance and the eradication of poverty are themselves conditionalities. The issue is whether the conditionalities make sense. In Mule's view, the conditionalities, at least in Africa in the last five years or so, make sense because they focus on good governance and the reduction of corruption. Human rights should also be added. Conditionalities must also be doable, as oftentimes they cannot be operationalized.

As the discussion was coming to an end, a participant asked what happens immediately after the Conference and urged the audience to take advantage of the opportunity that IFPRI has created by gathering high-powered decisionmakers. The participant noted that IFPRI has developed into an organization that uses high-quality data for action and for advocacy. IFPRI was encouraged to take the resolutions that come out of this Conference to the upcoming World Food Summit: five years later, indicating the types of people who were here and using the powerful data presented here. Because many of the participants at this Conference will not get to that forum, it is important that the resolutions that come out of this Conference influence the World Food Summit: five years later. The Chair, von Braun,

agreed, noting that the Conference provided an excellent opportunity to reach the top international leaders and to hear what they had to say on the food security and absolute poverty agenda. Continued action at the international level, in whatever form, with these actors is extremely important, and the 2020 Vision Initiative should continue to have targeted briefings for these very important actors.

During his closing remarks, von Braun referred to the opening speech of President Johannes Rau of Germany, in which he said that human rights and the environment have their lobbies all over the world, whereas the fight against poverty and hunger does not. Von Braun noted that this fundamental problem brings the focus back to political will, and he expressed hope that the Conference would help strengthen the lobby on fighting poverty and hunger.

Von Braun also addressed the question of connecting the priorities to the actors and the discussions of the last two sessions of the Conference. He offered three examples. First, the issue of empowerment certainly requires strengthening democracy and taking on the rights agenda, but it also requires reform to bring decisionmaking closer to the grassroots. These actions entail totally different groups of actors and alliances than the second highest priority, which is strengthening propoor growth through trade liberalization, science and technology, and agrarian reforms. And a whole different set of actors comes into play in facilitating the food security of the poorest through targeted transfers, safety nets, and social security, whether through charity or the public sector.

Finally, von Braun mentioned that new information and communications technologies, particularly the Internet, could help promote food security at the local level. Many local actors are connected, and if they learn from each other and mobilize jointly they could create a global force that could overcome the lack of lobbying power for the food insecure, the small farmers, and the agricultural and food community.

Per Pinstrup-Andersen, IFPRI's Director General, reflects on what the Conference has accomplished.

Chapter 24

Concluding Remarks

Per Pinstrup-Andersen
Director General, International Food Policy Research Institute

This has been an extremely productive three days. I think we all deserve very high praise, because it has been tough. Have we achieved our objectives? Let me recall the three objectives we had from the start. First, exchanging knowledge. We have shared ideas and an immense amount of information. More than 80 speakers addressed this audience during the Conference and we had tremendous participation from the floor.

Second, breaking complacency. There was no complacency in this group when we arrived and there certainly is none as we leave. Have we broken complacency outside of this room? No, not yet. Will we? I hope so. We don't know if that objective will be achieved. But if we all go away from here with the commitment to make it happen, then it will happen. It depends on all of us. IFPRI will do its part, but that is not nearly enough.

Third, catalyzing action. Have we done that? Among ourselves, yes. But this is a self-selected group. We need to spur action out there among the ministers of finance, among those who can make a difference. And we all have to contribute to that. During the three days we have spent in this room, 90,000 preschool children have died, more than half of them of hunger and nutrition-related illnesses. That is a lot of lives wasted for absolutely no reason except that those in power have not taken action. Action is extremely urgent. What can we do tomorrow and in the near future? We need to transmit this sense of urgency and the importance of food security to people outside this room.

I would like to present a few highlights of the Conference. We all agree that we need a higher priority on effort to ensure sustainable food security for all by 2020, sooner if we can. We have said that lack of political will is the major bottleneck in achieving sustainable food security for all. Some have argued that we need to empower the people we are trying to help so they can exert pressure from the grassroots. The problem is that if governments have to empower poor people so that they can tell the government to do something government doesn't want to do, then it will not happen. So we must find another way to empower people so they can make demands not only on governments, but also on IFPRI and on NGOs.

Some of us have said, yes, there is a lack of political will, but there is also a lack of local capacity. Many countries simply do not have the capacity to

ensure food security, even with the best of political will. Let's not forget that, and let's not tell the world's governments that none of them have had political will, because that isn't true. Some do, some try very hard, some succeed. But some simply don't have the capacity.

What is it that we are trying to do? Are we trying to eradicate poverty? Food insecurity? Malnutrition? We've had a bit of a debate about this. My answer is that we are trying to do all three. But that answer is too broad to guide action, because the action we take will be somewhat different depending on which goal is the top priority. My guess is that the best indicator or index is probably child malnutrition. Why? Because both poverty and food insecurity become very slippery concepts when you try to quantify them. If a person earns less than $1 a day, does that mean that person is poor? Maybe yes, maybe no, depending on the context. Maybe a person earning less than $20 a day is poor, maybe a person earning 50 cents a day is not poor. The poverty line is a relative concept. But if a child is stunted, if a child doesn't grow to full capacity because of malnourishment, that we can measure.

We should stop arguing about whether to use one approach or the other and help poor people to put together whatever mix of approaches it takes to design appropriate solutions to their problems.

Nutritionists have taught me that even using malnutrition as the indicator has some problems associated with it. But whatever indicator we choose, what we are trying to do is to rid the world of three things: malnutrition, food insecurity, and poverty.

Some of you have suggested that the goal embodied in the 2020 Vision is in competition with the World Food Summit goal. I want to assure you that this is not the case. The two are compatible. We support, to the best of our ability, the World Food Summit goal to halve the number of malnourished people by 2015. If we can do this, our next goal is to get rid of hunger for the rest by 2020. Is this going to happen? It could. It's possible. Will it happen? That depends on what we do between now and 2020.

With business as usual, no it won't happen. We will neither achieve the World Food Summit goal of reducing the number of malnourished people by half nor will we achieve the 2020 Vision. But these goals are compatible and they are on the same track.

How do we achieve the World Food Summit goal and the 2020 Vision? We've been discussing a draft 2020 Vision document that we prepared for you. We hope to get much more feedback from you before we finish this document by the end of September. But what is very clear from research by IFPRI and others is that three things have to be in place to achieve the 2020 Vision: pro-poor economic growth, empowerment of poor people, and provision of public goods. First, economic growth that benefits the poor. Now that can be very different from economic growth period, which might benefit only wealthy individuals or nations. Pro-poor economic growth benefits poor individuals and poor nations. Second, empowerment of poor people. It may be difficult to do that, but we should try. And third, effective provision of public goods such as primary education, agricultural research, and infrastructure that are needed to solve these problems. But public goods will not be produced by the private sector. National governments are the principal providers of public goods. We also have providers of international public goods but national governments hold the key.

We have discussed how important agriculture is. I don't think anybody would disagree that what really matters is improving the livelihoods of low-income people. We must help bring them out of poverty in

whatever way we can. And if it isn't agriculture, let's try something else. But let me remind you that 75 percent of poor people live in rural areas. They depend on agriculture either directly or indirectly. We have to focus the action on rural people. Yes, a lot of poor people are moving to urban areas and malnutrition and poverty are moving with them, because we haven't solved these problems in rural areas. Still, three-quarters of poor people worldwide and 90 percent of poor people in Sub-Saharan Africa live in rural areas.

What kind of technology should we be focusing on? It really impressed me to hear that whether we were talking about agroecological, conventional research and technology, genetic engineering, or other biotechnology approaches, they all work. We didn't have to take the researchers' word for it; the farmers told us that. We should stop arguing about whether to use one approach or the other and help poor people to put together whatever mix of approaches it takes to design appropriate solutions to their problems. If we start with the solution and then go searching for the problem, we will certainly miss the boat. We must start with the problem and then work backward until we get the appropriate solution.

We also heard that we need to move toward full costing, meaning that if agriculture is doing damage to the environment, that damage has to be paid for preferably as part of agricultural production costs. That may seem like a trivial detail, but it isn't.

What about globalization? Is it good or bad for the poor? That's the wrong question. That's like asking: Is a knife good or bad? A knife can be used to slice bread and to do rather wonderful things. Or it could be used to kill somebody. So the question is not whether globalization is good or bad for the poor. The question is: How can globalization be guided and accompanied by policy reform so that it benefits rather than harms people who are malnourished, poor, and food insecure?

One of the things we learned during this Conference is that policies, including agricultural policies, in industrialized countries matter tremendously to poor people in developing countries. It came up time and time again. We need to get our act together in Europe, North America, and Japan with respect to trade-distorting policies, farm subsidies, and export subsidies, that whole set of agricultural policies in the industrialized world that harms food security in developing countries. But developing countries themselves must get their domestic policies in order, too, so the potential benefits from globalization can in fact reach the poor. The benefits of globalization shouldn't stop with the top 5 or 10 percent of the population. National policies in developing countries have to be reformed, so that there is something for everybody. We in the developed or rich countries have to do our part to ensure more equitable distribution of globalization's positive impacts.

How do we deal with water scarcity? This is an increasingly important problem. What we were told was to increase efficiency in agriculture. Agriculture is the big water user. If we can increase efficiency in agricultural water use, we can reduce the amount of water needed for agriculture.

We need to worry about soil mining. In many locations, more nutrients are removed from the soil than are put back. Land degradation is rampant in a number of locations, resulting in yield reductions.

We talked about the future of small-scale farming. A lot of you don't really believe that small-scale farming has a long-term future. But then again, it depends on what we mean by small. In South Asia, most of the farmers grow their crops on plots of land smaller than half a football field. Is that a viable farm? Maybe it is a part-time farm. Who knows? But there was a very interesting discussion and we will keep working on that issue.

We talked about conflict. We heard that as long as armed conflict exists, we cannot achieve sustainable food security.

We talked about corruption. It seems to me that the

…policies, including agricultural policies, in industrialized countries matter tremendously to poor people in developing countries.

legal rules we have in the industrialized countries ought to apply when dealing with developing countries. For example, if a Dane bribes another Dane in Denmark, and that is illegal in Denmark, it should also be illegal for a Dane to bribe a person in another country. It is not illegal in most countries today. It ought to be.

We talked about the importance of women in development. We had an exciting session this morning on that matter. We talked about HIV/AIDS and how that interacts with food security. We talked of course about the list of the seven action areas developed by IFPRI.

Let me move very quickly to who needs to do what. We need to join forces. Solving food security problems is not something that the NGOs can do by themselves, or that national governments can do by themselves, or, believe it or not, that IFPRI can do by itself. We all need to cooperate—private sector, public sector, civil society, NGOs. First and foremost, we need to include the intended beneficiaries, the people we are trying to assist. They must help design the solutions that fit their problems.

We talked about decentralization. We insisted that we needed new institutions to make all of this happen. We need to turn dialogue into action. But first we need to turn shouting into constructive dialogue, then we can move to action.

I want to remind you of what the President of Germany said the first day of this Conference. Some years ago, the OECD member states agreed that they, the industrialized nations of the world, should each allocate at least 0.7 percent of their country's GNP to foreign development assistance. As far as I know, only three or four countries are at or above that level, the rest are well below. We need to put pressure on governments in industrialized countries to move towards 0.7 percent. We also need to target what is available much better to alleviate poverty and food insecurity in the 49 least developed countries.

I repeat: We must support with everything we've got the 1996 World Food Summit goal of halving worldwide hunger by 2015 and the World Food Summit: five years later. I have been in regular contact with the FAO. This morning, I talked to a high-level FAO representative who I believe is in this room, and it is my understanding that FAO will make every effort to make it possible for us to share results from this Conference and to interact with the World Food Summit.

We must support with everything we've got the 1996 World Food Summit goal of halving worldwide hunger by 2015 and the World Food Summit: five years later.

I am quite sure that we will be able to report on this 2020 Vision Conference at the World Food Summit: five years later.

But that is not enough. It is just the first step. We must be present at all international conferences relevant to ending hunger and poverty, and we must impress on people the importance of getting food security for all as soon as possible. We must try to build food security goals into anti-poverty strategies. We must work with high-level decisionmakers in governments and international institutions because they are the ones that may be able to take this message forward. We can help. We are currently discussing the creation of what we have dubbed the Bonn Food Policy Circle with a number of parliamentarians, ministers, and other high-level government decisionmakers. This group will take these messages further, to their own countries and beyond to achieve a greater multiplier effect from this conference.

We need formal dialogue across the stakeholder groups. We need to bring the NGOs and the private sector together with the public sector.

This is probably not something IFPRI can do. But somebody has to try to bring about a constructive dialogue across these various stakeholder groups.

Somebody suggested today that we should start an advocacy campaign on the points of agreement that have emerged from the 2020 Vision Conference. Yes, IFPRI can certainly play a role, but probably only a very small role. We are a research institution. We can make knowledge and information available for such an effort. We can monitor progress, provide food security and investment indices, and so on. I am sure we need this. I am not so sure who should do it. I will discuss this with FAO and within IFPRI's Board of Trustees to determine what role IFPRI should play.

But I agree that an annual, country-by-country index that specifies advances made and not made would be very useful. Monitoring some of those indicators will be extremely important. I doubt if it is something a small research institute like IFPRI can do, but I will discuss it with the Board of Trustees.

Let me now end by observing that the success of this Conference is due to tremendous teamwork. I want to thank some of the key people involved. First of all, we are extremely grateful to the cosponsors, to the advisory committee, to the German government, and to our partners in Germany.

I particularly want to thank Jochen de Haas and Jürgen Richter, both from Germany. I want to acknowledge my colleagues from IFPRI. Rajul Pandya-Lorch, thank you for everything you did to make this happen. I also want to recognize the work of Laurie Goldberg and Eleni Gabre-Madhin. You did a fabulous job. I want to thank the researchers and the communications team from IFPRI, headed by Klaus von Grebmer and Michael Rubinstein. And I want to thank the whole logistics and planning team, the chairs, the presenters, and the participants. It has been wonderful teamwork. So let me thank all of you and the long list of staff members whom I have not had time to name, and turn this meeting over to Geoff Miller, Chairman of IFPRI's Board of Trustees, who will close this Conference. Thank you.

During his closing remarks, Geoff Miller, Chair of IFPRI's Board of Trustees, emphasizes the role and responsibility each conference participant has for ending hunger.

Geoff Miller

Chair of the Board of Trustees, International Food Policy Research Institute

I had the privilege of opening this Conference, and I made the observation that when you came here, you were united by a moral judgment. You were also united by commitment and by being customers or collaborators in some way with IFPRI. I am sure that everybody will leave this Conference with their commitment deepened, with their knowledge strengthened, and with their relationship with IFPRI on a stronger and more permanent basis. We all feel that this has been a remarkably successful Conference.

Yet I also know that some few of you will go away feeling, "Well, I have been here at a talkfest for three days, but we didn't have an outcome—no unique conclusion or declaration. I did get insights and inspiration and I learned some new things, but when I look at the magnitude of hunger and malnutrition in the world, I am left wondering what is going to happen as a result of this conference?"

I want to try to try to reconcile those conflicting sentiments, by drawing upon two con-

We must try to build food security goals into anti-poverty strategies.

cepts. The first was conceived by Bryce Courtenay in his novel, *The Power of One*. Essentially, Courtenay's concept is that if one person takes the right actions with sufficient determination, the effect of that person's actions will multiply exponentially as others are captured to the cause.

The list of priorities we arrived at during this conference is not going to change, in itself, the circumstances of a single hungry and malnourished person around the world. If we have learned anything in the last two decades about agricultural development, we have learned that it's the decentralized actions of people at the grassroots that matter. Those actions become much more powerful to the extent that they are amplified as in Courtenay's novel—as the power of one becomes the power of many.

...we have learned that it's the decentralized actions of people at the grassroots that matter.

The second concept is that of revealed preference. According to this principle, it is not the priorities we set here that matter at the end of the day, it is the decisions that each and every one of you make when you go back to your own power base—no matter how big or how small that power base is. If you come from a development assistance agency in the first world, it's the decisions you make to allocate development assistance. If you happen to be a subsistence farmer from a developing country, it is the decisions you make about what to do with your land, your labor, and your limited capital.

Every one of you who came here with commitment, is going to go away with strengthened commitment. In your professional life, every one of you has a particular responsibility. You have a power base and real decisions to make—even if those real decisions are to significantly change what you're doing, that is, to find another job, to position yourself to do something differently. The sum of those revealed preferences—the things you do as individuals—will be much more important than all the documentation and all the lists put up on the wall. This Conference has empowered each and every one of us to make decisions when we go back to where we came from—to make better decisions and to renew our commitment.

I want to illustrate this by explaining a little of what this Conference has done for me. I spent some eight years deeply committed to the cause of world agricultural trade reform. In that time, I attended hundreds of negotiating meetings. At one particular point, the principle of reducing domestic support for first world agriculture looked like it was dropping off the agenda for the Uruguay Round. I got very angry about that, and so I jumped on a plane. I flew all the way from Canberra in Australia to Brussels. I went personally to the leader of the European negotiating team and remonstrated long and loud. I then went to the leader of the American negotiating team and told him how bitterly disappointed I would be if he allowed this principle to drop off the agenda of the Uruguay Round.

This Conference has rekindled a small spark of pride in what I did that day—flying all the way from Canberra to Brussels and back again to remonstrate—because we have now heard that the issue of domestic subsidies in the OECD countries will be addressed and progressed during the next round. If that flame stays alive, then I can have a little humble pride in having made some contribution during the course of my life—in having exercised the power of one.

After those negotiations, though, I closed shop, locked up that knowledge and experience, and went on to something else—to campaign

to be director general of FAO. I visited 66 countries; I visited villages, farmers, international and indigenous research stations, reserve banks, and presidents of countries. I committed to that campaign for 12 months, and during that time I got a lot of inspiration from a lot of people in a lot of places, in the third world particularly.

When Jacques Diouf won that election, I consoled myself with the fact that having a black African leader as the director general of FAO would be much more inspirational to the people on the ground battling hunger and malnutrition in the third world, than having a white European—even one from Australia—in the same position.

Since then, I have been working with the private sector in developing new technologies for agriculture. That is interesting and useful work, but this Conference has given me a new resolve to find some more tangible way to recommit to the cause of fighting hunger and malnutrition. I don't know exactly what I will do and when I will do it, but I will find a way.

Now, let me make a personal request to each and every one of you. When you go away from here, armed with the new inspiration and the knowledge that you have acquired, and armed with some new alliances and some new contacts that you have established, think about what you are going to do differently and write down a short list. Against each item on the list, write the realistic time by which you will have achieved each of those goals. Then find somebody whose respect you value and email your commitment to those people. Ask that person to hold you accountable. Accountability is crucial to all our performance. So, if you genuinely

Every one of you who came here with commitment, is going to go away with strengthened commitment.

Appendix 1: Conference Program

MONDAY, SEPTEMBER 3, 2001

1200–1700 REGISTRATION

1900– **Welcome Reception Hosted by Mayor of Bonn**
Bonn Town Hall

TUESDAY, SEPTEMBER 4, 2001

0730–1500 REGISTRATION

0845–1020 **Welcome and Opening Remarks**

Chair: Geoff Miller, Chair of the Board of Trustees, International Food Policy Research Institute
H.E. Johannes Rau, President, Federal Republic of Germany
H.E. Apolo Nsibambi, Prime Minister, Republic of Uganda (on behalf of H. E. Yoweri Museveni, President, Republic of Uganda, and Chair of the 2020 Vision Initiative's International Advisory Committee)
Heidemarie Wieczorek-Zeul, Federal Minister for Economic Cooperation and Development, Federal Republic of Germany
Bärbel Dieckmann, Lady Mayor of Bonn
Per Pinstrup-Andersen, Director General, International Food Policy Research Institute

1020–1030 **Food Security in a New Context: The Need for This Conference**

Rajul Pandya-Lorch, Head of the 2020 Vision Initiative, International Food Policy Research Institute

Food Insecurity: Why Haven't We Solved the Problem?

1030–1100 **How Committed Are We to Ending Hunger?**
Chair: Piet Bukman, President of EuronAid and former Minister of Development and former Speaker of the Parliament in The Netherlands
Keynote: Sartaj Aziz, Senator and former Agriculture Minister, Finance Minister, and Foreign Minister, Pakistan

1100–1130 **Successes and Failures in Achieving the Goals of the World Food Summit**
Chair: Michael Rewald, Director, Partnership and Household Livelihood Security Unit, CARE
Keynote: William H. Meyers, Director, Agriculture and Economic Analysis Division, Food and Agriculture Organization of the United Nations

1130–1300 **800 Million Still Hungry: Why Have We Made So Little Progress?**
1130–1215 **Chair: Angela Thoko Didiza,** Minister for Agriculture and Land Affairs, Republic of South Africa
Volker Hausmann, Secretary General, Deutsche Welthungerhilfe
Heinz Imhof, Chairman of the Board, Syngenta
David Beckmann, President, Bread for the World
1215–1300 **Audience Participation**

1300–1400 LUNCH

1400–1415 **Perspective from the Next Generation**
David Dalrymple, Student, U.S.A.

1415–1500 **Alternative Futures for Food Security**
1415–1435 **Chair: Manfred Kern,** Head of Global Technology Communication, Aventis CropScience
Mark Rosegrant, Senior Research Fellow, International Food Policy Research Institute
1435–1500 **Audience Participation**

Emerging Forces: From Here to 2020

DEMOGRAPHIC, HEALTH, AND NUTRITION FORCES

1500–1630 **A World in Flux: Changing Population Profiles and Needs**
1500–1545 **Chair: H.-Jochen de Haas,** Head, World Food Security and Rural Development, Federal Ministry for Economic Cooperation and Development, Federal Republic of Germany
Demography: John Bongaarts, Vice President, Policy Research Division, The Population Council
Nutrition: Lawrence Haddad, Director of the Food Consumption and Nutrition Division, International Food Policy Research Institute
Dietary Changes: Susan Horton, Professor of Economics and Chair of Division of Social Sciences, University of Toronto
HIV/AIDS: Gabriel Rugalema, Senior Policy Advisor, United Nations Development Programme's Regional Project on HIV and Development for Sub-Saharan Africa
1545–1630 **Audience Participation**

ECONOMIC FORCES

1630–1700 **What Productive Resources Do the Poor Really Need to Escape Poverty?**
Chair: Christian Friis Bach, Chairman of the Board, Mellemfolkeligt Samvirke and Associate Professor of International/Development Economics, Royal Veterinary and Agricultural University, Denmark
Keynote: Michael Lipton, Research Professor of Economics, Poverty Research Unit, Sussex University

1700–1715 **Award Ceremony for Youth Poster and Essay Competitions**

1800–2130 **Riverboat Cruise Reception,** jointly hosted by the Federal Ministry for Economic Cooperation and Development (BMZ) and the German Foundation for International Development (DSE)

WEDNESDAY, SEPTEMBER 5, 2001

0800–1500 REGISTRATION

0900–0930 **Making Globalization Work for Developing Countries: The Role of the World Trade Organization**
Chair: Mahmud Duwayri, Minister of Agriculture, The Hashemite Kingdom of Jordan
Keynote: Supachai Panitchpakdi, Designate Director General of the World Trade Organization (WTO) and Former Deputy Prime Minister and Minister of Commerce of Thailand

0930–1100 **Putting Globalization to Work for the Poor**

0930–1015 **Chair: Isher Judge Ahluwalia,** Director and Chief Executive, Indian Council for Research on International and Economic Relations
Eugenio Díaz-Bonilla, Research Fellow, International Food Policy Research Institute
Robbin Johnson, Senior Vice President, Cargill
Chee Yoke Ling, Legal Adviser, Third World Network
Robert L. Thompson, Director of the Rural Development Department, World Bank
Ango Abdullahi, Special Adviser to the President on Food Security, Nigeria

1015–1100 **Audience Participation**

1100–1200 **The Long Arm of Industrialized Countries: How Their Agricultural Policies Affect Food Security**

1100–1130 **Chair: Wen Simei,** Professor, Institute of Economic Development, South China Agricultural University, China
Alex McCalla, Professor Emeritus, University of California at Davis
Shishir Priyadarshi, Agriculture Consultant (WTO), South Centre

1130–1200 **Audience Participation**

1200–1230 **Promoting Broad-Based Economic Growth and Food Security: A View from the European Union**
Chair: Per Pinstrup-Andersen, Director General, International Food Policy Research Institute
Keynote: Poul Nielson, European Union Commissioner for Development and Humanitarian Aid

1230–1330 LUNCH

TECHNOLOGICAL AND ENVIRONMENTAL FORCES

1330–1430 **The Future of Agriculture in Sub-Saharan Africa and South Asia: W(h)ither the Small Farm?**

1330–1400 **Chair: Peter Hazell,** Director of the Environment and Production Technology Division, International Food Policy Research Institute
Sub-Saharan Africa: Dunstan Spencer, Managing Director of Dunstan Spencer and Associates, Sierra Leone
South Asia: Ashok Gulati, Director of the Markets and Structural Studies Division, International Food Policy Research Institute, and member of Prime Minister's Economic Advisory Council, India

1400–1430 **Audience Participation**

1430–1500 **Turning Up the Heat: How Will Agriculture Weather Global Climate Change?**
Chair: Pedro Sanchez, Director General, International Centre for Research in Agroforestry
Keynote: Martin L. Parry, Director, Jackson Environment Institute, University of East Anglia

1500–1700 **Complementary Technologies, One Goal: Approaches to Sustainable Food Production**

1500–1600 **Chair: Klaus Ammann,** Director, Botanical Garden, University of Bern
Agroecological Approaches: Jules Pretty, Professor, Centre for Environment and Society, University of Essex
Agroecological Approaches: Manuel de Jesús Reyes, Farmer, Honduras
Conventional Approaches: Prabhu Pingali, Director of the Economics Program, International Maize and Wheat Improvement Center
Conventional Approaches: K. Rajarathinavelu, Farmer, Allivaram Village, Tamil Nadu, India
Biotechnological Approaches: Jennifer Thomson, Professor of Microbiology, University of Cape Town

1600–1700 **Audience Participation**

1700–1730 **Troubled Water, Water Troubles: Overcoming an Important Constraint to Food Security**
Chair: Margaret Catley-Carlson, Chairperson, Global Water Partnership
Keynote: Frank Rijsberman, Director General, International Water Management Institute

SOCIOPOLITICAL FORCES

1730–1800 **Food Insecurity—A Symptom of Poverty**
Chair: Courage Quashigah, Minister of Food and Agriculture, Ghana
Keynote: Clare Short, MP and Secretary of State for International Development, United Kingdom

THURSDAY, SEPTEMBER 6, 2001

0800–1500 REGISTRATION

0900–1030 **Empowering Low-Income Women**
0900–0945 **Chair: Agnes Quisumbing,** Senior Research Fellow, International Food Policy Research Institute
Education: Elizabeth King, Lead Economist, World Bank
Agricultural Programs: Wilberforce Kisamba-Mugerwa, Minister of Agriculture, Animal Industry and Fisheries, Republic of Uganda
Property Rights: Ruth Meinzen-Dick, Senior Research Fellow, International Food Policy Research Institute
0945–1030 **Audience Participation**

1030–1200 **Governance and Food Security: Acting in the Public Interest?**
1030–1115 **Chair: Solita Monsod,** former Minister of Economic Planning of the Philippines and Chair of the Philippine Human Development Network
Conflict and Food Security: Philippe Guiton, Africa Relief Manager, World Vision
Right to Food: Charlotte V. McClain, Commissioner–Economic and Social Rights, South African Human Rights Commission
Corruption: Tunku Abdul Aziz, Vice-Chairman, Transparency International
1115–1200 **Audience Participation**

Sustainable Food Security for All: Realizing the Vision

1200–1230 **The Roles and Responsibilities of Industrialized Countries in Assuring Sustainable Food Security**
Chair: Grace Akello, Minister of State for Entandikwa, Republic of Uganda
Keynote: Uschi Eid, Parliamentary State Secretary to the Federal Ministry for Economic Cooperation and Development, Federal Republic of Germany

1230–1330 LUNCH

1330–1530 **Setting the Priorities for Action**
1330–1430 **Chair: Keith Bezanson,** Director of the Institute of Development Studies, University of Sussex
Introduction: Rajul Pandya-Lorch, Head of the 2020 Vision Initiative, International Food Policy Research Institute
Ian Johnson, Chair, Consultative Group on International Agricultural Research, and Vice President, World Bank
Stewart Wallis, International Director, Oxfam GB
Mercy Karanja, Chief Executive, Kenya National Farmers Union
Klaus Leisinger, Executive Director, Novartis Foundation for Sustainable Development
1430–1530 **Audience Participation**

1530–1730 **Whose Responsibility Is It to End Hunger?**

1530–1630 **Chair: Joachim von Braun,** Director of the Centre for Development Research, ZEF-Bonn

Introduction: Robert Paarlberg, Professor of Political Science, Wellesley College, and Associate at the Weatherhead Center for International Affairs, Harvard University

Klemens van de Sand, Assistant President, Project Management Department, International Fund for Agricultural Development (IFAD)

Julian Gonsalves, Former Vice President for Program, International Institute for Rural Reconstruction

Usha Barwale Zehr, Joint Director of Research, Mahyco (Maharashtra Hybrid Seeds Co., Ltd.)

Harris Mule, Executive Director, Top Investment and Management Services, and former Permanent Secretary in the Ministry of Finance, Kenya

1630–1730 **Audience Participation**

1730–1745 ## Concluding Remarks

Per Pinstrup-Andersen, Director General, International Food Policy Research Institute

Appendix 2: Speakers—Biographical Notes

Ango Abdullahi

Professor Ango Abdullahi serves as special adviser to the president of Nigeria on food security. He previously held several high-level posts including appointments in the Cabinet. Abdullahi also served in a variety of senior positions at Ahmadu Bello University in Zaria, Nigeria, including vice chancellor (president), ranking professor, director of research and extension services, and lecturer. Abdullahi received his B.S. degree in agriculture at the University of Ibadan and Ph.D. in agronomy at Kansas State University.

Isher Judge Ahluwalia

Isher Judge Ahluwalia is director and chief executive of the Indian Council for Research on International Economic Relations. Prior to assuming her current position Ahluwalia was an economist at the International Monetary Fund, a fellow at the National Institute of Public Finance and Policy in New Delhi, and a research professor at the Centre for Policy Research, also in New Delhi. She has served as a consultant to the United Nations University and the Indian government. Ahluwalia is a member of IFPRI's Board of Trustees.

Grace Akello

Grace Akello has been minister of state for gender, labor, and social development (Entandikwa) in the Government of Uganda since 1999 and a member of Parliament since 1996. She has been active in sociopolitical and cultural issues in Africa for more than 30 years.

Klaus Ammann

Klaus Ammann has been the director of the Botanical Garden at the University of Bern since 1996. He has been a professor at the university since 2000. He is a member of a number of committees, including the coordination group of the European Science Foundation, the Biosafety Committee of the Government of Switzerland, and the GMO Expert Group of the European Commission Directorate General. He is chairman of the European Group of Plant Specialists in the World Conservation Union (IUCN).

Tunku Abdul Aziz

Tunku Abdul Aziz has occupied senior management positions in the public and private sectors in Malaysia, Hong Kong, and the UK. He helped found the Malaysian chapter of Transparency International, the global coalition against corruption. He is vice chair of the Board of Transparency International, a member of the World Bank High Level Advisory Group on Anti-Corruption in the East Asia and Pacific Region, and a member of the Asian Pacific Advisory Panel on Good Urban Governance.

Sartaj Aziz

Sartaj Aziz began his career as a policymaker in Pakistan in the 1950s, becoming a joint secretary in the Planning Commission in 1967. In 1971 he entered the field of international development, holding high-level positions at the Food and Agriculture Organization of the United Nations (FAO), World Food Council, and the International Fund for Agricultural Development (IFAD). In 1984 Aziz returned to Pakistan as minister of state for food, agriculture, and cooperatives, and subsequently held ministerial positions in finance and foreign affairs.

Usha Barwale Zehr

In her current position as joint director of research at Maharashtra Hybrid Seeds Co. (Mahyco) in India, Usha Barwale Zehr is responsible for research on plant biotechnology, technology transfer to farmers, and technology transfer from collaborators. She serves on a number of boards, including the M.S. Swaminathan Research Foundation and the Mahyco Research Foundation, and is a member of the Technical Advisory Committee of the Consultative Group on International Agricultural Research (CGIAR).

David Beckmann

David Beckmann is president of Bread for the World, a Christian citizens' movement against hunger. Beckmann is a Lutheran pastor, commissioned at his ordination to be a missionary-economist. He served in Bangladesh for a church-related relief and development agency and at the World Bank for 15 years before moving to Bread for the World.

Keith Bezanson

Keith Bezanson is the director of the Institute of Development Studies at the University of Sussex. Bezanson has devoted his entire career to international development. During the mid-1960s he worked as a secondary school teacher in Nigeria, and subsequently lectured and directed a national research program in Ghana. He then joined the Canadian International Development Agency. In 1985, Bezanson became Canada's ambassador to Peru and Bolivia. From 1991 to 1997 he was president of the International Development Research Centre (IDRC) in Canada. In March of 1997 he assumed the directorship of the Institute of Development Studies.

John Bongaarts

John Bongaarts is vice president of the Policy Research Division at the Population Council. Bongaarts has worked at the Population Council since 1973. His research has focused on a variety of population issues, including the determinants of fertility, population-environment relationships, the demographic impact of the AIDS epidemic, and population policy options in the developing world. He is currently serving as chairman of the Panel on Population Projections of the U.S. National Academy of Sciences, National Research Council. He is a member of the Royal Dutch Academy of Sciences and a fellow of the American Association for the Advancement of Science.

Piet Bukman

Piet Bukman, president of EuronAid since May 2001, has been a leading decisionmaker in his native Netherlands. He has served as minister for development cooperation (1986–1989), minister of foreign trade (1989–1990), and minister of agriculture, nature-management and fisheries (1990–1994). He was president of the Christian Democratic Party from 1980 to 1986, and has served as spokesman in both the Upper and Lower houses of Parliament and as speaker of the Lower House. He continues to be the chairman of the Foreign Affairs Committee of the Christian Democratic Party.

Margaret Catley-Carlson

Margaret Catley-Carlson has been involved in governmental and international policymaking and programs for more than 30 years. She was president of the Canadian International Development Agency from 1983 to 1989 and of the Population Council from 1991 to 1999. A former assistant undersecretary in the Department of External Affairs and deputy minister of health in Canada, she is currently chair of a number of international organizations, including The Global Water Partnership.

David Dalrymple

At age 10, David Dalrymple is a part-time student at the University of Maryland, an avid reader and writer, a musician, inventor, designer, community volunteer and fundraiser, and an experienced speaker. The Johns Hopkins University Talent Search awarded him a distinction in both verbal and math skills, noting that at age 8 David scored higher than the average 18-year-old. Disney and McDonald's have recognized David for his volunteer work, choosing him from more than 100,000 children worldwide as one of their 2000 Millennium Dreamers.

H.-Jochen de Haas

H.-Jochen de Haas is an animal scientist heading the Section for Rural Development and World Food Security in the German Federal Ministry of Economic Cooperation and Development (BMZ). He joined BMZ in 1978 where he has worked in various capacities, including having responsibility for policy guidelines for agricultural and rural development and advising on international agricultural research programs.

Manuel de Jesús Reyes

Manuel de Jesús Reyes is a smallholder farmer and part-time extensionist for the Association of Advisors for a Sustainable, Ecological and People-Centered Agriculture (COSECHA) in Honduras.

Eugenio Díaz-Bonilla

Eugenio Díaz-Bonilla is a senior research fellow in IFPRI's Trade and Macroeconomics Division. Before joining IFPRI as a visiting research fellow in 1995, he was in charge of agricultural trade analysis and negotiations at the Embassy of Argentina in Washington, DC. He has also worked with a number of governments and international organizations in Latin America and the Caribbean on macroeconomic, trade, and poverty policies.

Angela Thoko Didiza

Angela Thoko Didiza has served as the South African minister for agriculture and land affairs for the last two years. She was deputy minister for agriculture from 1994 to 1999. Before that she was involved in a number of civic and nongovernmental organizations, including as national deputy general secretary of the South African Young Women's Christian Association, member of the Women's Advisory Committee of the South African Council of Churches, and national general secretary of the Women's National Coalition.

Bärbel Dieckmann

Bärbel Dieckmann was elected lady mayor of Bonn in 1995. She was reelected in 1999. A member of the Social Democratic Party (SPD) since 1972, she has been active in local politics for 20 years. Currently she is also president of the German section of the Council of European Municipalities and Regions.

Mahmud Duwayri

Mahmud Duwayri is the minister of agriculture of the Hashemite Kingdom of Jordan. A scientist by training, he has held both senior academic and administrative posts. From 1984 to 1989 he served as dean of the Faculty of Agriculture, University of Jordan, and then as a professor in and dean of the Faculty of Agricultural Sciences at the United Arab Emirates University. He subsequently served as director general of Jordan's National Center for Agricultural Research and Technology Transfer and director of FAO's Plant Production and Protection Division. He became Jordan's minister of agriculture in 2001.

Uschi Eid

Uschi Eid is the parliamentary state secretary to the Federal Ministry for Economic Cooperation and Development of the Federal Republic of Germany. Eid has served in both parliamentary and international development posts for the German government. She has been a member of parliament for more than 10 years. She coordinated a program for trained returnees in Eritrea for the German Agency for Technical Cooperation (GTZ). Eid became parliamentary state secretary in 1998.

Christian Friis Bach

Christian Friis Bach is an associate professor of international/development economics at the Royal Veterinary and Agricultural University in Denmark. Bach has been active in a number of nongovernmental organizations, such as Amnesty International and Third World Import. In 1993–94 he took the initiative to establish a fair trade organization in Denmark (Max Havelaar). From 1997 to 2001 he was chairman of the Danish Association for International Co-operation (MS). He is a board member of the Centre for Development Research and the International Institute for Sustainable Development.

Eleni Gabre-Madhin

Eleni Gabre-Madhin is a research fellow in IFPRI's Markets and Structural Studies Division. Gabre-Madhin joined IFPRI as a postdoctoral fellow in 1998. She was previously an economic affairs officer at the United Nations Conference for Trade and Development (UNCTAD) in Geneva, Switzerland. A citizen of Ethiopia, Gabre-Madhin earned a B.A. in economics from Cornell University, an M.Sc. in agricultural economics from Michigan State University, and a Ph.D. in applied economics from Stanford University.

Julian Gonsalves

Julian Gonsalves is the former vice president for program at the International Institute of Rural Reconstruction (IIRR). He has had 25 years of experience in international rural and agricultural development. For 15 of those years he had senior-level responsibility for program development and management at IIRR. Before joining IIRR, he served for 3 years on the NGO Committee of the CGIAR and has won several awards, including, most recently, the Sustainable Agriculture and Rural Development award from Germany in 1997.

Philippe Guiton

Philippe Guiton began his career in international relief in Chad, where he worked as a logistics officer, orphanage director, and country representative for German Emergency Doctors. He then worked in Ethiopia and Somalia for the United Nations High Commissioner for Refugees. Guiton joined World Vision in 1995 as director for Burundi, subsequently becoming regional relief coordinator for East Africa. Currently he is Africa relief manager for World Vision's responses to complex humanitarian emergencies in the region.

Ashok Gulati

Ashok Gulati is the director of the Markets and Structural Studies Division at IFPRI. He has served in both academic and policy advising capacities. Prior to joining IFPRI in 2001, Gulati was a NABARD chair professor at the Institute of Economic Growth and chief economist at the National Council of Applied Economic Research, both in New Delhi, India. He was also a member of the Economic Advisory Council of the Prime Minister of India.

Lawrence Haddad

Lawrence Haddad is director of the Food Consumption and Nutrition Division at IFPRI. Before joining IFPRI as a research fellow in 1990, Haddad was a lecturer in quantitative development economics at the University of Warwick. He recently completed a one-year sabbatical as a visiting scholar at the London School of Economics. Haddad's research focuses on a wide range of issues related to the well-being of the poor.

Volker Hausmann

For almost 20 years Volker Hausmann served the city of Bielefeld, Germany, in various administrative capacities. For half that time he was first the treasurer and then the head town commissioner. In 1995 he became the secretary general of Deutsche Weltungerhilfe (German Agro Action).

Peter Hazell

Peter Hazell served as director of IFPRI's Agricultural Growth Linkages Program prior to becoming a principal economist in the World Bank's Agriculture and Rural Development Department. In 1992 he returned to IFPRI as director of the Environment and Production Technology Division. Hazell currently conducts research on sustainable farming practices.

Susan Horton

Sue Horton is a professor of economics and chair of the Division of Social Sciences at the University of Toronto. Horton works on issues of nutrition, health, labor markets, and poverty in developing countries, and is the editor of four books and author of many journal articles, book chapters, and technical reports on these topics. She has served as a consultant to many agencies, and has worked in a variety of countries.

Heinz Imhof

Heinz Imhof is chair of the Board of Directors of Syngenta. From 1996 to 1999, he was deputy executive head of Novartis Agribusiness and head of Novartis Seeds. He subsequently became head of Novartis Agribusiness and a member of the Novartis Executive Committee. Imhof was recently appointed president of the International Food and Agribusiness Management Association.

Ian Johnson

Ian Johnson is the key decisionmaker and spokesperson on the World Bank's environmental and social work. In this position, which he assumed in 1998, he oversees the Environment, Rural Development, and Social Development departments, and heads the Bank's Environmentally and Socially Sustainable Development Network, as well as the CGIAR. His earlier positions at the Bank include senior manager of the environment department and administrator of the Global Environment Facility.

Robbin S. Johnson

Robbin Johnson joined Cargill in 1971. He became its senior vice president for corporate affairs in 2000. He is on the board of the Cargill Foundation; the International Policy Council on Food, Agriculture and Trade; and the National Center for APEC (the Asia-Pacific Economic Cooperation forum). He chairs the board of the Canada-Minnesota Business Council and is a past chair of the U.S. Feed Grains Council.

Mercy W. Karanja

Mercy Karanja is chief executive of the Kenya National Farmers Union. She has had more than 20 years' experience in agriculture and rural development. She served for 16 years in Kenya's Ministry of Agriculture, leaving at the level of assistant director in 1998 to join the Kenya National Farmers Union. In her current position she is involved in all aspects of farm policy, including trade and the place of biotechnology in agriculture. She is currently preparing the African position for the upcoming second World Food Summit.

Manfred Kern

In 1984, Manfred Kern joined the biological research center of Hoechst AG/Frankfurt, where he was responsible for insect-resistance management and integrated crop management. In 1994 he joined the biological research department at AgrEvo GmbH and worked on insect physiology/pharmacology and genetically modified plants. He currently heads Global Technology Communication within the Technology Strategy & Resources unit of Aventis CropScience.

Elizabeth King

Elizabeth King is a lead economist in the World Bank's Development Research Group. She is the task manager of a study of the impact of education reforms involving decentralization and privatization in a number of developing countries. Before joining the Bank, she taught economics at the University of the Philippines, Tulane University, and the University of California at Los Angeles.

Wilberforce Kisamba-Mugerwa

Wilberforce Kisamba-Mugerwa is the minister of agriculture, animal industry and fisheries in the Government of Uganda and a member of Parliament. He is also a senior research associate with Makerere Institute of Social Research, Makerere University, in Kampala. He holds a doctorate in agricultural economics and has a strong background in research, with particular interest in the management of natural resources for sustainable use and food security. He is a member of various research networks and regional and international associations.

Klaus M. Leisinger

Klaus Leisinger has been the vice president, delegate of the Board of Trustees, and executive director of the Novartis Foundation since 1990. He is also professor of development sociology at the University of Basel and serves as adviser to various national and international organizations dealing with sustainable development. Before joining the Novartis Foundation, Leisinger headed Ciba Pharmaceuticals' department of developing-country relations.

Chee Yoke Ling

Chee Yoke Ling is a legal adviser for the Third World Network on international law. Since 1993 she has worked closely with key developing-country negotiators, scientists, and NGOs to campaign for biosafety in genetic engineering. She participated in the process leading up to the United Nations Conference on Environment and Development in 1992 (the Rio Earth Summit), and she continues to be involved in the work of the Commission on Sustainable Development and the Convention on Biological Diversity.

Michael Lipton

Michael Lipton is a research professor of economics at the Poverty Research Unit at Sussex University. An expert on global poverty, Lipton's career has involved research in numerous countries in Asia and Africa. He conducted recent reviews of poverty for FAO and IFAD. His books include *Why Poor People Stay Poor: Urban Bias and World Development*, *New Seeds and Poor People* (with Richard Longhurst), and *Successes in Anti-Poverty*. He is also coauthor of the Nuffield Council on Bioethics report, "Genetically Modified Crops: The Ethical and Social Issues." In 1988–90 he directed IFPRI's Food Consumption and Nutrition Program.

Alex McCalla

Alex McCalla is a professor emeritus of agricultural economics at the University of California, Davis. He is best known for his research on international trade. His work has been honored by the American Agricultural Economics Association, which presented him with its Quality of Communication Award in 1979 and Quality of Research Discovery Award in 1982, and elected him a fellow in 1988. Throughout his academic career McCalla was associated with the University of California, Davis. He also directed the Agriculture and Natural Resources Department at the World Bank, chaired the Technical Advisory Committee of the CGIAR, and was a founding member and co-convenor of the International Agricultural Trade Research Consortium.

Charlotte McClain

Charlotte McClain is commissioner of economic and social rights at the South African Human Rights Commission. McClain joined the South African Human Rights Commission in August 1999. She has been serving on the Commission's Children's Rights and Disability committees since 1997. McClain has always been involved with human rights issues, particularly for children and people with special needs. She was project officer on child protection for the United Nations Children's Fund.

Ruth Meinzen-Dick

Ruth Meinzen-Dick is a senior research fellow in IFPRI's Environment and Production Technology Division. She grew up in a village in a semi-arid part of India, where she came to appreciate the importance of water and natural resources. She moved to the United States to undertake higher education. She joined IFPRI in 1989. Her current research focuses on the role of collective action in managing natural resources such as land, water, and trees; the various rights people have to these resources; the related gender issues; and the impact these factors have on people's livelihood strategies.

William H. Meyers

William H. Meyers is the director of the Agriculture and Economic Development Division of FAO. Meyers is currently on leave from his position as professor of economics at Iowa State University, where he has worked since 1979. Prior to joining FAO he was a visiting consultant at the World Bank, interim director of Iowa State University's Center for Agricultural and Rural Development and codirector of its Food and Agricultural Policy Research Institute, and executive director of the Midwest Agribusiness Trade Research and Information Center. He has also served as an agricultural economist at the Economic Research Service of the U.S. Department of Agriculture, a research fellow at the International Rice Research Institute, and a visiting professor at the University of Kiel.

Geoff Miller

Geoff Miller is the chair of the Board of Trustees of IFPRI and principal of GCM Strategic Services, an agribusiness consulting company based in Australia. Miller spent much of his 27-year career in the Australian civil service in the Bureau of Agricultural Economics, including 4 years as director, publishing widely in the fields of commodity economics, trade, and development. He went on to serve as director of the Economic Planning Advisory Council, associate secretary of the Department of Foreign Affairs and Trade, and secretary of the Department of Primary Industries and Energy. He served on many government boards, including those of the Australian Wheat Board and the Australian Wool Corporation.

Solita Monsod

Solita Monsod is a professor of economics at the School of Economics, University of the Philippines, and the chair of the Philippine Human Development Network, an NGO that undertakes research advocacy on sustainable human development. Monsod served as minister of economic planning in the Philippine Government from 1986 to 1989. She was named Cabinet Secretary of the Year in 1988 and 1989. Monsod has served on high-level committees such as the United Nations Committee for Development Planning. She is a columnist for a major newspaper and a commentator for a television news program in the Philippines. Monsod has also served as a member of the IFPRI Board of Trustees.

Harris Mule

Harris Mule is the executive director of Top Investment and Management Services. He is a development economist and policy analyst. During his international development career he has served as a planner in the Kenyan ministries of agriculture and planning, chief economist in the Ministry of Planning, and permanent secretary in the Ministry of Finance and Planning. He has also served as an assistant president of economic planning at IFAD. During the last 15 years, he has worked as an economic consultant in the fields of macroeconomic policy, economic governance, and agricultural development with several international organizations.

Poul Nielson

Poul Nielson is European Union commissioner for development and humanitarian aid. Nielson has been involved in Danish and European politics and policymaking since the mid-1960s. He has served as the Danish minister of energy and the minister for development cooperation, a member of the Danish Parliament, and the chair of the Social Democratic Foreign Affairs Committee. He also held corporate and academic posts, serving as CEO of LD-Energy Inc. and assistant professor in the Danish School of Public Administration. He became a member of the European Commission in 1999.

Robert Paarlberg

Robert Paarlberg is a professor of political science at Wellesley College and an associate at the Weatherhead Center for International Affairs of Harvard University. In addition to his current academic and research positions at Wellesley College and Harvard University, Paarlberg has served as a visiting professor of government at Harvard and a legislative aide in the U.S. Senate. He has been a member of the Board of Directors of Winrock International, a member of the Emerging Markets Advisory Committee at the US Department of Agriculture, and a consultant to the National Intelligence Council, US Agency for International Development, IFPRI, and the World Bank.

Rajul Pandya-Lorch

Rajul Pandya-Lorch is head of the 2020 Vision for Food, Agriculture, and the Environment Initiative at IFPRI. A citizen of Kenya of Indian origin, Pandya-Lorch joined IFPRI in 1987. Prior to her current position, Pandya-Lorch served as special assistant to IFPRI's director general. As head of the 2020 Vision Initiative, Pandya-Lorch oversees an extensive research, communications, and capacity-strengthening program, including the 2020 Vision Network for East Africa. Pandya-Lorch received her master's degree from Princeton University.

Martin Parry

A specialist on the effects of climate change, Martin Parry has directed the Jackson Environment Initiative since 1996, first at University College London and now at the University of East Anglia (UEA). At UEA Parry also serves as professor of environmental science. His other current positions include chair of the Intergovernmental Panel on Climate Change's Task Group on Scenarios for Climate Impact Assessment and member of the Scientific Advisory Committee of the United Nations Environment Programme's Climate Impacts and Responses Programme. He has won a number of awards, including the Order of the British Empire in 1998 for services to the environment and the World Meteorological Organisation's Gerbier-Mumm International Award in 1993 for contributions to research on climate change.

Prabhu Pingali

Prabhu Pingali is Director of the Economics Program at the International Maize and Wheat Improvement Center (CIMMYT). Pingali has 20 years of experience in assessing the extent and impact of technical change in developing-country agriculture in Asia, Africa, and Latin America. Before assuming his current position he was an agricultural economist at the International Rice Research Institute and an economist in the World Bank's Agriculture and Rural Development Department. Pingali is president-elect of the International Association of Agricultural Economists. He co-chairs the Millennium Ecosystem Assessment Panel's working group on future scenarios.

Per Pinstrup-Andersen

Per Pinstrup-Andersen joined IFPRI as its director general in 1992. Prior to this he was director of the Cornell Food and Nutrition Policy Program, professor of food economics at Cornell University, and a member of the Technical Advisory Committee to the CGIAR. Pinstrup-Andersen has also held research and directorship positions at other Future Harvest centers. He is a fellow of the American Agricultural Economics Association and the American Association for the Advancement of Science and the recipient of honorary doctoral degrees from various universities around the world. Pinstrup-Andersen received the 2001 World Food Prize in recognition of his 30 years' work to provide policy options to reduce hunger, poverty, and environmental degradation in developing countries.

Jules Pretty

Jules Pretty is a professor at the Center for Environment and Society (CES), a transdisciplinary research center at the University of Essex, UK. Prior to joining CES, he served as director of sustainable agriculture at the International Institute for Environment and Development in London. He is the author of a number of books on agriculture and the environment, a trustee of the Farmers World Network and The Pesticides Trust, and an adviser to government and the private sector.

Shishir Priyadarshi

Shishir Priyadarshi is an agriculture consultant on the World Trade Organization (WTO) at the South Centre. Prior to his current position, Priyadarshi worked with the Government of India for nearly 20 years, spending time in the Cabinet Office dealing with issues relating to the WTO and the Agreement on Agriculture on India's domestic agriculture production, and as counselor with the Indian Mission to the WTO in Geneva.

Courage Quashigah

Courage Emmanuel Kobla Quashigah (Maj. Rtd.) became Ghana's minister of food and agriculture in February 2001. He has been a member of Ghana's New Patriotic Party since 1992, and served as its national organizer from 1996 to 2000.

Agnes Quisumbing

Agnes Quisumbing is a senior research fellow in IFPRI's Food Consumption and Nutrition Division and a visiting associate professor at the School of Nutrition Science and Policy at Tufts University. Prior to joining IFPRI, Agnes Quisumbing worked at the World Bank, Yale University, and the International Rice Research Institute (IRRI). While conducting research for Yale and IRRI, she lived in rice-growing villages in the Philippines for several months, collecting information on gender differences in inheritance. She describes herself as equally comfortable running regressions and talking with women farmers about their lives.

K. Rajarathinavelu

K. Rajarathinavelu, a smallholder farmer, has been farming for 22 years. Paddy is the main crop grown on his farm. On unirrigated lands he grows pulses and sorghum. He lives with his wife, two children, and his parents in Pennathur village near Vellore, Tamil Nadu, India. He possesses a bachelor's degree in commerce.

Johannes Rau

Johannes Rau became president of Germany in 1999. His political career in the Social Democratic Party (SPD) has spanned more than 47 years in party, parliament, and government posts. For 20 of those years he served as minister president of North-Rhine/Westphalia, the most populous state in Germany. Rau led his party to decisive victories in numerous state elections in the 1980s and 1990s. He has stood as his party's candidate for chancellor of Germany. Earlier in his political career, he was minister of science and education, and during his ministerial tenure he established six universities, including Germany's first distance-learning university.

Michael Rewald

Michael Rewald has worked in overseas development for the past 20 years, mainly with NGOs. He has been with CARE since 1990, working both in country offices and in CARE USA headquarters in Atlanta. At the field level Rewald has managed a variety of rehabilitation and development projects and worked as director of programs in both CARE Ethiopia and CARE Bangladesh. For the past year he has been the director of CARE's Partnership and Household Livelihood Security Unit in the Program Division of CARE USA. The PHLS Unit deals with cross-cutting issues such as program design, monitoring and evaluation, partnership, and the household livelihood security framework, as well as with oversight for CARE's programs using food resources.

Frank Rijsberman

Frank Rijsberman is the director general of the International Water Management Institute. He has 20 years' experience as a natural resource planner in water-related projects in developing, transition, and developed economies. He cofounded Resource Analysis, a research and consulting firm in the Netherlands that provides services in water and environmental management. Rijsberman has been involved in international developments in water policy since 1992. In 1998 he was appointed deputy director of the World Water Commission's World Water Vision Unit, which was charged with the development of a world water vision. He is coauthor of the *World Water Vision* report and editor of the companion technical volume.

Mark Rosegrant

Mark Rosegrant is a senior research fellow in IFPRI's Environment and Production Technology Division. He leads IFPRI's research program on global food projections and also coordinates IFPRI's research on water and resource policy. Rosegrant has over 20 years of experience in research and policy analysis on agriculture and economic development. He received his master's degree and Ph.D. in public policy studies from the University of Michigan. He has published widely on food and water resource policy issues.

Gabriel Rugalema

Gabriel Rugalema has a background in crop science, resource and environmental economics, and development studies. He has worked as an academic in Tanzania and The Netherlands. He is currently seconded by Joint United Nations Programme on HIV/AIDS (UNAIDS) as senior policy adviser to the United Nations Development Programme's Regional Project on HIV and Development for Sub-Saharan Africa.

Pedro Sanchez

Pedro Sanchez was the director general of the International Centre for Research on Agroforestry (ICRAF) between 1991 and 2001. He chairs the CGIAR Inter-Center Working Group on Climate Change and represents the CGIAR on the Soil Fertility Initiative for Africa. He founded the CGIAR's Systemwide Alternatives to Slash-and-Burn Programme. Sanchez is coeditor-in-chief of Agroforestry Systems and professor emeritus of soil science and forestry at North Carolina State University.

Clare Short

Clare Short is a member of Parliament and secretary of state for international development of the United Kingdom. Short was a former civil servant at the Home Office before she became a member of Parliament in 1983. She was shadow minister for women from 1993 to 1995 and shadow secretary of state for transport from 1995 to 1996. In 1996–1997 she was the opposition spokesperson on overseas development in the House of Commons. She has been the opposition spokesperson on environmental protection, social security, and employment. She has also served as a member of the Home Affairs Select Committee and chair of the All-Party Group on Race Relations. A member of the National Executive Committee (NEC) of the Labour Party since 1988, she has served as chair of the NEC Women's Committee and chair of the NEC International Committee. She has been chair of the Human Rights Committee of the Socialist International since 1996.

Dunstan Spencer

Dunstan Spencer is managing director of Dunstan Spencer and Associates. In addition to managing a consulting firm in Sierra Leone, he is a member of Sierra Leone's National Food Security Committee and National Policy Advisory Committee. He was a senior lecturer at the University of Sierra Leone, director of the Research and Development Department at the West Africa Rice Development Association, principal economist at the Sahelian Center of the International Crops Research Institute for the Semi-Arid Tropics, and director of the Resource and Crop Management Division of the International Institute of Tropical Agriculture.

Supachai Panitchpakdi

Supachai Panitchpakdi assumes the post of director general of the World Trade Organization on September 1, 2002. He has held several prominent positions in the Thai government, including deputy finance minister, minister of commerce, and deputy prime minister. In these positions he was in charge of Thailand's participation in the Uruguay Round of trade negotiations and played an instrumental role in drafting Thailand's major economic policies. Supachai has also held top-level positions in the private sector, including president of the Thai Military Bank and chair of Nava Finance and Securities.

Robert L. Thompson

In addition to holding a senior position in the World Bank's Rural Development Department, Robert Thompson is a senior adviser at the Center for Strategic and International Studies. Prior to joining the World Bank in 1998, he served as president and CEO of Winrock International Institute for Agricultural Development, dean of agriculture and professor of agricultural economics at Purdue University, assistant secretary for economics at the US Department of Agriculture (USDA), and senior staff economist for food and agriculture on the President's Council of Economic Advisers.

Jennifer Thomson

Jennifer Thomson is a professor of microbiology at the University of Cape Town, South Africa. She was a postdoctoral fellow at Harvard Medical School, visiting scientist at the Massachusetts Institute of Technology, and associate professor in the Department of Genetics at the University of Witwatersrand. Before joining the faculty at the University of Cape Town, she was director of the Laboratory for Molecular and Cell Biology at CSIR, South Africa's largest science and technology research organization. She cofounded South African Women in Science and Engineering.

Klemens van de Sand

Klemens van de Sand's career in international development spans 25 years. He began as the representative of the Konrad-Adenauer-Foundation in Indonesia and then joined the German Federal Ministry of Economic Cooperation and Development. His posts in the ministry included deputy director general (Policy and Planning), Human Rights commissioner, and chair of the Organisation for Economic Co-operation and Development/Development Assistance Committee Working Group on Participatory Development and Good Governance. He has been assistant president of IFAD, responsible for programme management, since 1997.

Joachim von Braun

Joachim von Braun will become IFPRI's director general in September 2002. He currently directs the Center for Development Research and heads the center's Department for Economic and Technical Change. He is also a professor at the University of Bonn. From 1982 to 1993 Braun was a research fellow in and director of IFPRI's Food Consumption and Nutrition Division. Subsequently he held the Chair for Food Economics, Food Policy and World Food Issues at the University of Kiel. Braun is president of the International Association of Agricultural Economists and member of the Academy of Science of the state of Northrhine Westphalia.

Stewart Wallis

Stewart Wallis is the international director of Oxfam Great Britain. His career began in marketing and sales in the UK, followed by seven years at the World Bank working on industrial development in East Asia. He then joined Robinson Packaging in UK, spending nine years there, five of them as managing director. In 1992 he joined Oxfam GB, where he has overall responsibility for its role in 70 countries worldwide.

Wen Simei

Wen Simei was the founding dean of the College of Economics and Trade at South China Agricultural University, where he now teaches and where he directs the Institute of Economic Development. He is also professor and director of the Guangdong Center for Asia-Pacific Economic Studies, a cross-institutional organization under the provincial government, and serves on IFPRI's Board of Trustees.

Heidemarie Wieczorek-Zeul

Heidemarie Wieczorek-Zeul became the German Federal Minister of Economic Cooperation and Development in 1998. She began her political career in the Social Democratic Party (SPD) in the mid-1960s, becoming city counselor in Russelsheim in 1968. Since then she has held a number of administrative and political posts, including member of the European Parliament, member of the SPD's presiding body, SPD spokesperson on European policy, and deputy chairperson of the SPD.

Appendix 3: Selected Summary Notes Prepared by Speakers

All speakers were invited to submit summary notes on the topic of their presentation for distribution to Conference participants. These notes can be found on the Conference website at http://www.ifpri.org/2020conference. Included in this appendix are the notes of those speakers who were unable to present their note or whose presentations significantly differed from the written version. Please find in the following pages unedited summary notes for the following presenters:

- Klaus Ammann
- Eugenio Díaz-Bonilla
- Robbin Johnson
- Mercy Karanja
- Wilberforce Kisamba-Mugerwa
- Michael Lipton
- Robert Paarlberg
- Jules Pretty
- Pedro Sanchez

SUMMARY NOTE

Panel Discussion: Complementary Technologies, One Goal: Approaches to Sustainable Food Production
Panelist: Klaus Ammann, Director, Botanical Garden, University of Bern
Title: Thoughts About the Future of Agriculture: Science and Fiction in the Risk Assessment Debate

Many Different Roads to Success in Plant Breeding and Farming

Instead of indulging into a fruitless debate about what strategy would be appropriate in agriculture, it would be much more rewarding in looking at the best way forward for a given country, a given ecology and economy. Looking for sustainable and equitable farming methods means in my eyes to refrain from any kind of ideological debate and concentrate on pragmatic decisions in order to find the best solution for a given region.

Roads to success in these areas are many, and we must pursue them all. In the first stage of fascination with the new technologies, a number of other pest-control strategies lost much—too much, in my view—of their appeal. We should have a closer look at mixed cropping and test critically its sustainability. Also, we will have to enforce research in biocontrol, which should also include a good package of risk assessment. Modern agriculture could benefit enormously from the knowledge and experience of organic farmers, whom I regard as visionaries of no less importance than the genome researchers who bring us important progress. We should apply our new knowledge about individual genes constructively to methods of cultivation that preserve or enhance soil fertility. On the basis of our new, sophisticated genomic knowledge it should be possible to develop transgenic plants capable of defending themselves against pests by producing their own organic pesticides, substances that remain active for a limited time only and, ideally, perform their functions only in specific endangered organs. Scientists are now looking for means of controlling genes in such a way as to prevent the formation of these effective ingredients in plant reproductive organs. In this way, the risks involved in crossing out undesirable genes could be elegantly avoided. There are several ways of preventing gene flow as such: Apomixis is a very promising one, where embryos develop spontaneously, not needing to be started by cross-fertilization—a strategy used by many wild species. Wyse use of technology protection mechanisms could also help to prevent geneflow, at least for the strictly autogamous crops. We should also have a close look at the seemingly old-fashioned methods of breeding pollen sterile crops—in maize this has been achieved recently. Does this sound like a futuristic vision? Admittedly, it will take several years to accomplish many of these improvements, but thanks to the breakthrough in genome decoding, such dreams are now within reach.

We should take the unique opportunity to pursue this ecological approach to plant breeding. This will require active cooperation with those organic farmers who are at least willing to entertain the possibility of incorporating other genes in their crop plants. At present, the market has nothing to offer organic farmers as an encouragement to join this still modest faction. Although lower pesticide and herbicide consumption is often cited as an argument in favor of these first transgenic varieties, most organic farmers are hardly impressed, as they have long since cut back the use of chemical agents substantially (albeit in favor of organic pesticides, which are not without significant problems of their own). Yet organic farmers frequently fail to think far enough ahead. They should not be indifferent to the fact that the transgenic, herbicide-tolerant soy bean permits a form of crop cultivation in which ploughing is virtually unnecessary—a giant leap forward in the battle against soil erosion. Like conventional farmers, organic farmers can ill afford to reject potential improvements out of hand on dogmatic principles. After all, yields in long-term organic field trials are still comparatively low, and it is in the best interest of those directly concerned to seek improvements.

On the other hand, we now know that soil organisms flourish considerably better in organically farmed fields, a fact that should give the defenders of conventional farming methods pause for thought. I have learned from my own personal contacts that dialogue is possible, although it is clear where at least one of the problems lies. With their heavily ideological point of view, many organic farmers tend to isolate themselves excessively from modern developments. All official advocates of organic farming categorically reject the introduction of other genes into crop plants, for example. They are quick to support the superficial fear-mongering arguments of nongovernment organizations that do not even hesitate to fuel resistance to transgenic livestock feed in the face of firmly established scientific knowledge. My own personal experience has shown me that dialogue is possible and that even the most dedicated organic farmers are capable of learning as well. My own surname can be traced back in a straight line to the Anabaptist founder of the Amish community in the US state of Pennsylvania—a certain Jakob Ammann, one of our families direct ancestors, who's name has been used to denominate the 'Amish.' This courageous emigrant, like so many others a victim of a broad and brutal campaign of religious "cleansing," established the Mennonite sect in 1693 and laid the cornerstone for the many Mennonite village communities now found throughout North America. These groups have preserved not only their religious beliefs but their traditional organic farming methods as well.

Those who see these Amish farmers as stubborn learn in their first personal encounter with them that such is not the case. One is amazed at how deeply curious the Amish are. I can confirm, at any rate, that the friends I have been privileged to meet do not fit the stereotype of narrow-minded fanatics. As organic farmers, they do not reject technology out of hand but instead examine every innovation closely in an effort to determine whether it might pose a danger to their religion or way of life. If they are convinced of the potential benefit, they have no reservations about introducing milk cooling systems and other modern technologies. I had a number of surprisingly amiable, objective discussions with Amish organic farmers about genetic technology, and to my amazement, they decided to test samples of genetically modified seeds soon afterwards. Transgenic potatoes are currently being grown on a trial basis on their farms. And there is no reason whatsoever to suspect that these genetically altered potatoes might disrupt their religious and social system in any way at all.

I have no way of knowing whether the Amish will actually begin cultivating these new varieties of potato in earnest, and that is ultimately their decision alone, the latest news hint to an adoption case by case. I was impressed by how quickly these very traditional Amish farmers, of all people, accepted the idea of testing the new varieties of potato. As I learned later, the laudable pragmatism that characterizes their approach to such difficult issues is a function of their unique spirituality and the strong sense of security they derive from their religion.

I have gained a very similar impression in conversations with practicing Buddhists. Their natural curiosity and their willingness to consider even genetic technology without prejudice has fascinated and impressed me time and time again. The most striking example of such a seminal conversation I have ever experienced took place in the Botanical Gardens at the University of Bern, where I had the good fortune to spend a half-hour discussing genetically engineered crop plants with a dignified yet quite cheerful teacher of the Dalai Lama. He, too, exhibited neither prejudice nor fear with regard to this visionary technology that is unfortunately much too often condemned without a thorough hearing process in this country.

Science and Fiction in Risk Assessment Research Related to Transgenic Crops

The new knowledge in molecular genetics will have a much more profound impact on food production than the "Green Revolution" of several decades ago, it could enable us at long last to achieve rapid progress in the

breeding of the most common crop plants such as rice, corn and wheat. The growth of genetic knowledge will have consequences one never could have imagined before. The most promising genes of crop plants will be an open book within only a few years from now. Significant progress has already been made with the genetic material of the rice plant, and major private agricultural corporations have made some of the fruits of their rapidly intensified research available—free of charge—on a worldwide scale.

The optimistic and visionary outlook is one side of the medal, the other side is the bitter debate about the risks we are taking with field releases of transgenic crops. Opponents of the new technology range from fundamentalists denying the new technology all benefits and fervent defenders who do not see the slightest problems. There is unfortunately a lot of partisan thinking on both sides and—as often, the truth lies in-between.

Lets take the well known example of the Bt-crops. Ever since the Nature paper of Losey appeared, people had to learn that the colorful larvae the beautiful and popular Monarch butterfly in the US can be killed by Bt Pollen within 4 days by 40 percent. Shockwaves of newspaper articles went around the globe and Monsanto lost some 5 percent of its shares within a few days. But even Losey himself warned about the interpretation of his lab results. Today we know that the Monarch larvae and the adults will nicely survive in vast fields of Bt crops. We know it from field tests, there are today lots of data available. Beneficial insects even have a better life in Bt corn fields, since they are not showered by pesticides. Roundup Ready crops can be grown with the new conservation tillage methods, in favorable conditions the soil microflora thrives under no tillage conditions much better than with crops treated with classic herbicides. It becomes now visible that transgenic crops, wisely designed and used, will add to the sustainability of agriculture.

Also it has become clear in the last years, that gene flow happens wherever possible, as it has done in the former days of agriculture. But today the transgenes act as marker genes and we can, for the first time in history, follow up with extreme precision what is going on in the fields. The present day transgenes do not pose any significant problems once they have escaped to their wild relatives through outcrossing. And outcrossing is only possible there where wild relatives are in the reach of viable pollen grains of crops, which produce after pollination viable hybrids. The latest long-term experiment of Crawley shows that, after 10 years, the four transgenic crops tested just vanish and have a considerably lower survival chance than their non-transgenic counterparts.

But one has also to realize that the early risk assessment data have been scanty and not at all convincing, and in the early days of the US approvals things looked a bit shaky in the hindsight. And also we should remain cautious about long-term effects and install some monitoring programs after commercialization. This would help us to avoid mistakes we have done earlier with the introduction of pesticides. We do not know enough today about the long-term effects in the highly-complex food web of insects.

It would also be wrong to dismiss the general anxiety of a large portion of the population about biotechnology, since it becomes clear now that biology as a science has lost its innocence and people have a very finely tuned sensitivity on what's going on. After all, the new molecular technologies will change the course of Evolution. But it is also true that we have started to strongly influence evolution a long time ago—with crops even several thousand years ago. In modern times we have without hesitation sped up mutational breeding with gamma radiation—with modern wheat we do still not know, what we have done to the genomes with those rather inconsiderate methods. But we all eat bread from wheat which has undergone such mutations. So the whole difference is that today we eat mutant food and in future we will eat gene food, where we know much better what we have done.

It would be a grave error to concentrate on the negative side of transgenic crops, since they offer important opportunities for modern farming. And it is modern farming we will have to install all over the world,

since it is a fiction to believe that a trend back to traditional methods would solve the most urgent problems in feeding the world. But it would also be naïve to think that genetic engineering alone would save us all. Well-established global civil society organizations and also the United Nations Development Unit advocate a more intensive agriculture in order to save the last unharmed biotopes of this globe.

We learned extraordinarily quickly from the early years of genetic engineering through experiments involving the introduction of individual genes from other organisms into genetic material. Some of these first-generation transgenic plants have since been introduced in many different countries and are now producing good yields. Although the ecological and economic benefits vary from region to region, and have been only modest in some areas, most farmers who have been able to use these varieties effectively are thoroughly convinced of the advantages they offer.

The rapid expansion of genomic knowledge will soon make it possible to create resistances against parasitic fungi that are still causing disastrous crop damage today. We should be wary, however, of simply replacing the chemical "club" with the genetic club in the field of pest control. We would be far better off applying the elegance of breeding methodology to more meaningful goals, such as enhanced tolerance against drought, high salt concentration in soils and a better crop performance in cold climates. First successful developments in research labs will soon approach commercialization phase.

Efforts to realize romantic notions about nature in the fields with the aid of genetic technology surely make little sense today. It should be possible, however, to increase species diversity in the agricultural context and thus put an end to the dismal reign of monocultures. Our endless war against wave after wave of new pests on these vast, monotonous fields should prompt us to rethink our approach. We must win such battles in the future if we are to increase our food supply while alleviating ecological consequences at the same time. It should also be stated very clearly that farming with transgenic crops is not scale dependent: this is shown in China, where thousands of small cotton growers are very happy with the transgenic traits. Imagine a bag full of seeds where all seeds have a streamlined genome adapted to local ecological conditions and specific quality demands. On the other hand the seeds in the same bag offer a full variety of different resistance genes (whether transgenic or not), thus enhancing dramatically biodiversity again.

An excellent way to solve these complex problems on risk assessment and risk management in an open debate offers New Zealand. In a rigorously open, balanced and transparent debate, all accessible on the Internet under http://www.gmcommission.govt.nz/, thousands of submissions, testimonies and rebuttals have been published, and recently the Royal Commission of New Zealand has come out with a balanced report which you can download from the given Internet address. This tedious and lengthy debate process did not leave any room for cheap populist slogans and will eventually lead to balanced solutions, well adapted to the needs of New Zealand.

Another good source of information is http://www.bio-scope.org, a new website with a content database accessible over hundreds of keywords, daily news about biotechnology, and a daily clipping service for newspaper articles. Also you have access to a range of experts willing to answer individual questions.

Note: The views expressed in this summary note are those of the author and are not necessarily endorsed by or representative of IFPRI or of the cosponsoring or supporting organizations.

SUMMARY NOTE

Panel Discussion: Putting Globalization to Work for the Poor
Panelist: Eugenio Díaz-Bonilla, Research Fellow, International Food Policy Research Institute
Title: Globalization, Poverty, and Food Security

Sharply Divided Views

My presentation today on globalization, poverty, and food security draws on work that we are conducting at IFPRI, as well as other sources. A more detailed discussion of this topic appears in the 2020 Focus that Sherman Robinson and I edited, and that has been distributed during this conference (Díaz-Bonilla and Robinson 2001).

Any analysis about globalization, poverty, and food security must acknowledge the sharply divided views on the subject. The following quotations are among the many that can be extracted from any of the current writings on the topic:

> "Instead of reducing inequalities, globalization… exacerbates them… The poorest countries are getting poorer, both in relative and absolute terms… In the final analysis it is democracy itself which is the prime victim of… globalization…" Article in *Le Monde Diplomatique* (May 1997)
>
> "Globalization… marks the successful worldwide spread of the economic liberalization that began nearly 50 years ago… It is now bringing unprecedented opportunities to billions of people throughout the world. Inevitably those who fear markets and foreigners clamor against it. Their voices must be ignored" Article in the *Financial Times* (May 1997)
>
> Those disagreements have emerged in more painful and tragic ways from Seattle to Genoa.

What are the reasons for those disagreements?

The reasons for the sharply divided views are several, but at least three levels can be identified:

First, there are differences about the facts, how to interpret them, and what is the relevant time period of analysis, among other issues (see a discussion in Kanbur 2001). For instance, incomes per capita in developing countries as a whole at the end of the 1990s were about 5.2 times higher than in 1960s and life expectancy had increased by 13 years. But 15 percent of the developing countries at the end of the 1990s had incomes per capita lower than in the 1960s, and about 6 percent had lost years of life expectancy over the same period. When compared with the 1980s, 34 percent had lower income per capita and about 23 percent of the developing countries (mostly in Sub-Saharan Africa and former republics of the Soviet Union) have lost years of life expectancy in the 1990s.

But what is the relationship between globalization and those outcomes? This is the second area where disagreements may emerge, related to the meaning of globalization and what are the main drivers, as well as how to separate what is caused by globalization (however defined), and what is happening because of other reasons.

What is globalization and what are the main drivers?

In our work at IFPRI we utilize a broad definition of globalization. It is not just trade liberalization, and includes more than only economic aspects such as larger capital, labor, and technology flows, although all those elements are part of the process of globalization. But the idea of globalization also sees to encompass other aspects such as (a) the increased political, social, and cultural linkages among people and nations of the world; (b) the development of common legal and regulatory frameworks and institutions, from environmental

and trade treaties to best practices in accounting and banking, or international agreements on control of bribery; and (c) the increasing emergence of global effects from the behavior of individuals and societies, from spread of HIV/AIDS to the recurrence of financial crises.

Depending on the meaning highlighted, the analysis may differ. For instance it seems encouraging the spread of democracy at the political level: at the beginning of the 1990s for the first time the number of democratic governments was larger than non-democratic ones (Gurr et al. 2000). Different observers have attributed this trend in part to the globalization of communications (Giddens 1999). But others, looking at the spread of global advertisement, may worry about the dangers of cultural homogenization.

Differences arise not only about the meaning of globalization but also about what is causing it. The polar views in this regard are:

- Globalization as something that governments are "doing" to their citizens as a result of policy choices; and
- Globalization as something that is "happening," as a consequence of forces outside of the control of any country.

Certainly the drivers of globalization include market-oriented policies, but also some general trends such as technological change, particularly communications and transportation, the end of Cold War and reduction of conflicts, and population growth (the number of people on the planet more than doubled since the 1960s). This last factor by itself is creating more economic, social, and environmental linkages. Of course, the policy implications of emphasizing some drivers over others may be different, as well as the assessment of the degrees of freedom governments may have to choose among policy alternatives.

Different factors affecting the link between globalization and poverty

Another source of discrepancies in the assessments regarding the links between globalization and poverty is how to deal with three distinct focus of analysis that are not always properly distinguished: first, globalization as the process of getting more integrated in the world system; second, what are the relevant domestic conditions, institutions and policies interacting with globalization; and, third, how is the world economy functioning. To use an analogy, the impact of opening up the windows of your house (first level) on the well being of those living in a house, will depend on their own health conditions (second level), but also on the weather outside (third level).

For instance some studies found that rather than economic openness other domestic factors were more important to explain income inequality outcomes, such as land distribution, lack of education and civil liberties; demographic transitions; the nature of technological change; and the type of endowments, with primary exporters appearing more associated to rising inequality (see a discussion in Kohl and O'Rourke 2000).

Also a country's performance in terms of growth and poverty alleviation is tied to the overall functioning of the international economy. For example, during the 1960s and 1970s, high growth, negative real interest rates, and high prices for commodities benefitted the relatively resource-abundant, primary exporters of Africa and Latin America, which then also received much of the international capital flows. Poverty declined rapidly during those years. But then, the collapse in world commodity prices after the 1980s, mostly due to changed macroeconomic and agricultural policies in industrialized countries, affected negatively their growth rates and poverty conditions. Since the 1980s countries in those regions went through a painful process of fiscal adjustments to reduce the public-sector imbalances and external debt accumulated during the previous decades.

More recently, world economic volatility seems to have increased, mostly linked to swings in world capital markets influenced by changes in policies in industrialized countries. If the probability of financial crises increases with globalization, the poor will face additional risks.

Two main implications of the previous discussion are the need for complementary domestic policies in developing countries to benefit from globalization, and the responsibility of industrialized countries in shaping the operation of the world economy.

I will concentrate my last remarks on these two aspects.

Policy response to poverty and hunger

Policies in Developing countries

Adequate domestic policies in developing countries are key for growth, poverty alleviation, and food security. These policies include maintaining a stable macroeconomic framework; promoting open and competitive markets; ensuring good governance, transparency, and the rule of law; implementing programs and investments that expand opportunities for all, with special consideration for vulnerable groups; and providing adequate safety nets.

Because three-quarters of the world's poor depend directly or indirectly on agriculture, rural development has to be given special attention. Some have argued that increased agricultural trade protection in developing countries would ease poverty and promote food security. But this would be equivalent to a regressive tax on food consumption, which would harm poor consumers and mostly benefit large agricultural producers. A better approach for developing countries is to eliminate policy biases against agriculture; increase investments in health, education, and human capital in general; improve management of land and water resources; facilitate land ownership by small producers and landless workers; promote improved agricultural technology, rural infrastructure, and nonagricultural rural enterprises; and encourage organizations to expand the social capital and political participation for small producers and the poor. Food security in developing countries also requires equitable economic growth, and adequate food utilization, which depends on empowerment of women, health and education investments, and better governance. Developing countries may also need policy instruments to protect the livelihoods of the rural poor from import surges, and, in the current World Trade Organization (WTO) agricultural negotiations, they may legitimately insist that industrialized countries first reduce their high levels of subsidization and protection of agriculture.

Policies in industrialized countries

But at least as important for world poverty reduction are the policies of industrialized countries. After all they define the global economic, political, and environmental agenda and context, and therefore cannot evade their responsibility to make this world a better place, especially for the poor. A number of broad policy issues require attention.

Peace, democracy, and good governance. Continued international diplomatic and political engagement and financial support is crucial to bring peace and reconciliation to countries affected by conflict and to sustain fragile transitions towards democracy. Otherwise, regional security problems and humanitarian crises will keep recurring. Improved codes of conduct and controls governing arms trade are essential, as well as equitable international frameworks to reduce the flow of products (diamonds, drugs) that generate resources for war. Rich nations must also ensure that their firms abide by anti-bribery codes and that there are no safe havens for money laundering, while strongly supporting anti-corruption efforts in developing countries.

Trade liberalization in products of interest to developing countries. Low-income countries have historically faced high trade barriers in industrialized countries in products, such as agriculture and textiles, that best reflect the developing world's human and natural resource endowments. The Uruguay Round began to

address some of the imbalances that developing countries suffer in international trade, but did not solve them. Efforts to rectify those imbalances should continue. In particular, current negotiations must eliminate the combination of agricultural protectionism and high subsidies in industrialized countries that has limited agricultural growth in the developing world and has weakened food security in vulnerable countries by competing with their domestic production. Also, WTO related rules should consider the development needs of poor Member countries, and do not impose disproportionate administrative burdens.

International capital and aid flows. The last 20 years have witnessed serious international financial crises, several of which arose from policy changes in industrialized countries that affected exchange rates, interest rates, and capital flows, with destabilizing effects on weaker countries. Although developing countries must reduce their vulnerability through better macroeconomic and financial policies, these may not be enough if the main industrialized countries do not foster world financial stability with adequate macroeconomic policies. Moreover, the poorest countries, lacking access to international capital markets, need resources through aid flows. They would benefit from the acceleration and expansion of the Heavily Indebted Poor Country Initiative (HIPC) and the implementation, and future increase, of aid targets for donor countries. Finally, international financial institutions should increase funding for rural and agricultural development, poverty alleviation, and health and nutrition interventions.

Technology and public goods. Expanded adaptive research on agricultural technology, and biotechnology in particular, focused on the needs of poor farmers and consumers in developing countries can contribute to enhance food security, nutrition, and health. Yet, during the 1990s, growth in investment in agricultural research in, and for, developing countries stalled, and for some regions even decreased. Industrialized countries can help by fostering a serious debate over environmental, health, ethical, and equity concerns with respect to both agricultural biotechnology and agricultural research in general. Most importantly, they can provide scientific and financial support for technology development in poor countries and facilitate creative public-private partnerships. Similar arguments apply to research on health issues that overwhelmingly affect the world's poor. Finally, the proper balance between public- and private-sector concerns about intellectual property rights continues to be debated, indicating the need to explore that relationship further.

Environment. Global environmental concerns, from climate change to stressed ecosystems, are complex and addressing them will involve tangible costs. But costs and uncertainties should not obscure their important implications for the food security, health, and nutrition of the world's poor. Deteriorating environmental conditions may reinforce vicious cycles of conflict over resources and humanitarian crises, and the poor will pay the higher price for delays. Complaints in industrialized countries about developing countries enjoying unfair trade advantages from presumed lax environmental regulations (which, if true, would have only local effects) appear inconsequential when compared to the larger responsibilities of rich countries in shaping global environmental conditions that may adversely affect some of the poorest of the planet.

Political and institutional considerations. Anti-poverty programs based on making globalization work for the poor must also include the notion of establishing better institutions of global governance. But different voices have been raised against this possibility, usually linked to traditional protectionist, isolationist, and unilateralist views. The current discussion about globalization echoes much of the same arguments when at the end of WWII, having experienced the horror of two global wars in less than half a century, the world had to face the pressing task of establishing an international political, military, and economic architecture to prevent similar tragedies, and to facilitate global economic prosperity. Now as then, global problems require global approaches and institutions. Protectionism, isolationism, and unilateralism will not solve them.

Conclusion

Making globalization work for the poor and hungry requires adequate domestic policies in developing countries.

But it also needs that the diplomatic, military, trade, financial, technological, environmental and institutional policies of the industrialized countries foster a pro-poor international environment. Developing countries are being told time and again to put their own houses in order, but it is difficult to maintain a well-kept house in a neighborhood in turmoil — and the shape of that neighborhood is basically defined by industrialized countries.

The latest wave of globalization has helped create enormous wealth at the world level. But still too many are not sharing in it. The persistence of poverty and hunger amidst affluence is an avoidable moral tragedy and a drag on the world economy. Poverty and hunger are problems that can be addressed, if humanity, particularly those better off, can summon the political will to do so.

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SUMMARY NOTE

Panel Discussion: Putting Globalization to Work for the Poor
Panelist: Robbin S. Johnson, Senior Vice President, Corporate Affairs, Cargill, Incorporated

Introduction

Over the past decade, the number of people living in extreme poverty remained unchanged at 1.2 billion. While this is a smaller proportion of the world's population today than ten years ago, much more and faster progress needs to be made.

Addressing Poverty Where It Is Found

First, one has to attack poverty where it is found. About 70 percent of the world's poor live in rural areas, and most of them depend on agriculture for their livelihood. To make a large dent in global poverty, economic development has to reach rural areas and farming.

What Do the Poor in Rural Areas Need?

The first thing the poor in rural areas need is to increase agricultural productivity.[1] Higher yields for staple crops is necessary to open up the prospect of escaping poverty. But this leads to the first of several paradoxes to be encountered on the road to sustainable development. Rising agricultural productivity reduces the need for people in farming. It transfers people out of agriculture and creates a need for off-farm employment.[2] Unless off-farm job opportunities are created in rural areas and regional centers, these people will flee to large urban areas, depressing urban wages and straining urban resources.

In addition to rural jobs, the poor in rural areas need a way to make their agricultural productivity gains self-sustaining. While public-sector research and extension is needed to start productivity gains, private enterprise is needed to sustain them. So, a second paradox to manage involves the transition from public assistance to private enterprise in rural economies.

There actually is a reasonable degree of consensus around the broad outlines of coping with both paradoxes. For example, U.S. Treasury Secretary Paul O'Neill recently described how the international financial institutions might best address the challenge of raising living standards among the world's poorest:

> "First and foremost, the development banks must focus their efforts on raising productivity growth in the developing world…
>
> "…Economic history has taught us, for example, that investing in agriculture while laying the foundation for diversifying into competitive, privately owned manufacturing is a key to development…
>
> "Because a market economy relies on institutional bedrocks like the rule of law, enforceable contracts and a stable government free of corruption, the development banks should actively promote sound governance and public-sector management in borrowing countries…
>
> "…Grants are the right way to help an already heavily indebted country provide education, health, nutrition, water and sanitary needs for its poorest people and to help fight AIDS and other infectious diseases. Loans should be made only when there is an expectation that principal and interest will be paid back in full and on time…
>
> "…As the financial conditions of individual countries improve, we should create a system of loan rates that moves toward the private-market interest rate…

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[1] Remarks by Robert Thompson, Director of Rural Development for the World Bank, at a seminar in Beijing, China, November 2000.

[2] B.F. Johnston, "Agriculture and Structural Transformation in Developing Countries: A Survey of Research," *Journal of Economic Literature* 8 (June 1970): 396-404.

"Finally, it is essential that the multilateral development banks become more rigorous about measuring their own results."[3]

While O'Neill was addressing how the international financial institutions can best help the poorest, his model of appropriate public and private sector roles has more general applicability and allegiance. Some of the additional elements of that consensus are relevant to this discussion.

National government policies in these poorest countries need to stimulate the development process. That begins with wringing out any policy bias against agriculture, including any overvalued exchange rates, export taxes or domestic industrial protection that raises farm input costs. Curbing corruption, ensuring civil order and providing broad access to risk capital are crucial. Investing in human capital (education, health and sanitation services, safety nets), physical infrastructure (roads, bridges, harbors) and facilitating institutions (property rights, predictable dispute resolution, information systems) are necessary supporting steps. So is appropriate investment in agricultural research and development.

Domestic market reforms also are needed. Public or parastatal monopolies need to give way to entrepreneurial competition. Job creation in rural communities and mid-sized cities needs emphasis to avoid overcrowded urban centers. More transparent capital markets and more progressive labor standards are required to stimulate investment and to protect against worker abuses. Within households, better nutrition practices and more gender equity are important in lowering birth rates and raising healthier children.

The specifics of this development model have to be adjusted to the endowments and circumstances of different countries. But, the general pattern is well understood and widely endorsed: peasant economies built on traditional resources and practices need to be transformed by infusions of capital and ideas. Knowledge and mechanical power must replace ignorance and drudgery. And all of this capacity-building precedes any significant infusion of private globalization into the development process.

Where Private Globalization Fits In

Getting economic development that helps the poorest started is largely local work. Its first brushes with globalization probably are with the international development banks and with non-governmental organizations working on the ground to stimulate growth. Eventually, however, self-sustaining economic development must connect with the private global marketplace of trade, investment and knowledge transfer.

This interface is controversial and emotional in some quarters. To them, even the thought of private foreign investment, particularly in agriculture, seems anathema. Though this point of view needs rebutting, time doesn't permit dealing here with those arguments. I want to focus on the more conventional issues around how the global private sector can help reduce poverty among those where the processes of economic development have begun to take root.

There are several ways in which useful connections can be forged:

(1) *Trade* — the industrialized countries offer important potential markets for the exports of poor people in poor countries. Unfortunately, these markets are often in highly protected sectors, like agriculture or textiles; the United Nations estimates these lost markets are worth $700 billion.[4] A new and more successful WTO trade round could unlock much of this potential.

(2) *Trade facilitation* — poor countries often face other kinds of barriers in exporting to developing country markets, especially agricultural and food products. Food safety standards may be unfamiliar; packaging and handling practices may be inadequate; quality levels may be substandard or uneven. In some cases, these barriers have protectionist motives behind them, but in many cases there are real issues involved in achieving consumer acceptance. Global food and agricultural companies can help developing

[3] U.S. Treasury Secretary Paul H. O'Neill, "The Best Investment in Helping Poor Nations," *The New York Times* (July 17, 2001), op. ed.

[4] "The Poor Who Are Always With us," *The Economist* (July 1, 2000): 46.

countries incorporate needed safety, handling and quality practices, first to gain access to developed markets and, over time, to develop a reputation for high standards.

(3) *Food security* — poor countries and poor people are particularly vulnerable to interruptions in their food supplies, since they are living at the margin of subsistence even in normal times. Trade-based food security can be a critical supplement to local production, for a number of reasons: (a) local harvests are much more variable than annual global output, where good crops in some areas offset poor crops elsewhere; (b) intercountry transportation costs are a fraction of annual storage costs; and (c) trade reduces food storage losses from pests, disease or rot.

An open food system, in other words, enhances food security at lower financial and social costs than today's mix of self-sufficiency and food-aid strategies. But it requires eliminating trade barriers in agricultural commodities and processed foods while providing financing vehicles that keep the poor from being squeezed out of the bidding in years when import needs surge.

(4) Environmental stewardship — before global population growth levels off, the world will need to double its food production. To do that without converting more forests to farming, it will need to intensify production on existing hectares. To do this without exhausting or polluting surface and groundwater supplies or using excessive chemical pesticides will require wider access to new production technologies, including biotechnology.

Knowledge-intensive agricultural systems, broadly disseminated, are the only way the world can feed all its people better while reducing farming's global footprint. There are challenges to making this aspect of globalization work effectively for all, but there is no alternative that serves both the poor and the environment as well.

(5) *Agricultural biotechnology* — genetically modified plants have become a central bone of contention in discussions about the effects of globalization on the poor. For wealthy consumers, the technology may be discretionary. For poorer consumers, for malnourished consumers, for farmers struggling to control pests, viruses and bacteria in more environmentally sustainable ways and for those who work on the frontiers of feeding all people better, agricultural biotechnology is an essential tool. The challenges in its use are: how to get the technology applied to the food or production problems of the poor; how to structure effective public-private partnerships that facilitate broad dissemination of the technology and its products; and how to develop private ag biotech industries in developing countries serving the resource, social and market challenges at the top of their priority lists. Today's often sterile confrontations need to give way to more productive dialogue and collaboration, if these challenges are to be met.

(6) *Higher labor standards* — we all have been made aware of problems around sweatshops, child labor abuses and worker safety problems. Though these are troubling incidents, they also demonstrate that globalization is raising standards for people, products and plants. Most large companies already make it a practice to bring their "first world" standards with them, and they are quickly learning that where they don't, globalization's new communications capabilities will expose them.

The result should be a process of economic development with softer externalities than occurred under Western industrialization. That should translate more quickly into better products, better working conditions and better places to live for the poor.

(7) *Economic justice* — economic development creates new consumers, people with the income to translate their needs and wants into effective demand. Aid recipients become consumers with purchasing power, calling forth markets that bring new choices and opportunities.

Some criticize the rise of markets—and particularly globally-driven markets—because of resulting income inequalities. Excessive inequality deserves to be disciplined, but the benefits of economic development also need to be acknowledged—an increase in life expectancy; higher living standards for the poor in absolute terms; and more resources for addressing social and environmental needs.

In weighing these various effects, more attention also needs to be given to the ways in which globalization can enhance community well-being. Economic development brings new means of connecting people, from electricity to roads to telecommunications. Companies train employees and give money, time and talent to address community needs, lifting individual and communal aspirations and offering means for fulfilling them. Private globalization need not be just about creating private wealth; it also can harness talents and resources to make whole communities better.

Conclusion

Globalization is not a panacea. In fact, it typically is a much smaller influence in eradicating poverty than are the actions of national governments, domestic markets and individual households. Nor is globalization always and automatically an improvement over traditional conditions. But it generates resources and transfers ideas that can be used for individual and community betterment.

Among other things, it makes agricultural productivity gains and rural economic diversification more achievable. And it makes food security, environmental stewardship and improved general living conditions more attainable. The better response is not to block globalization but to channel it through the right choices.

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SUMMARY NOTE

Panel Discussion: Setting the Priorities for Action
Panelist: Mercy Karanja, Chief Executive, Kenya National Farmers Union

Introduction

At the World Food Summit in November 1996, the heads of states or government for around the world pledged their commitment "to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level not later than 2015."

Food in security reduction trends in developed and developing countries are clearly different with agriculture playing a critical role in the economies of the low—income developing countries. In these countries, 70B80 percent of the population live and depend directly or indirectly on agriculture. This is to be compared with only 2B5 percent of the population in the European Union and other high-income countries.

The trends in Sub-Saharan Africa are still very discouraging with levels of malnutrition and poverty increasing other than reducing as already indicated by projections from IFPRI. Sub-Saharan Africa is the only region in the world in which the number and percentage of children who are malnourished is expected to rise rather than fall over the next 20 years. This is based on assumptions of increased cereal production.

The trends in Sub-Saharan Africa have raised concern, as the region is also home to the majority of the world=s poor. In the Horn of Africa, studies have shown 50 percent of the people surviving on less than US$1 per person per day. The connection between poverty and food security is important. For the majority of the poor, agriculture is the main source of livelihoods. This means it is only when poverty is alleviated or diminished that levels of food insecurity can be reduced.

The long-term solution to food insecurity is therefore is beyond production of additional food and includes the need to address rural livelihoods in general. Social safety nets are an important factor in Africa that has taken different forms in different countries.

Causes of food insecurity in Africa: (a) production resources, (b) marketing information and credit systems, (c) conflict, (d) population growth, and (e) HIV/AIDS and food security.

Production Resources. This will include mainly land and water. In most of Africa, the greatest numbers of poor people are concentrated in arid and semi-arid ecosystems. In these systems the farmers depend on relatively fragile resource base for their herds. The production systems that have been introduced have proved not sustainable and large herds are still lost during times of drought to be recovered again during the rainy season.

This results to a vicious cycle of environmental degradation, increased poverty and food security. The factor of land in the high potential areas is of concern as the more productive land is subdivided into small and uneconomical units for agricultural production. In Ethiopia, for example, 40 percent of farm households have less than 0.5 hectare of land and more than 60 percent have more than 1 hectare from which to support a family of 6B8 people.

This is, some parts of Africa, due to poor access land by the farmers and in other parts, for example, Kenya, is due to the excessive fragmentation of productive land due to inheritance. The exploitation of the less areas of low rainfall has been extremely low, e.g. in the Horn of Africa, only 6 percent of the cropped area and less than 1 percent of the cultivable area is irrigated compared to 37 percent in Asia.

The pastoral systems have received little attention with dwindling support from governments, for veterinary care, and especially markets. This is a system that needs attention as in the relatively drier parts of Africa, livestock will still be the best investments.

Marketing, Information, and Credit Systems. The other types of resources that are not in place for conducive production include information, markets, and credit systems. Knowledge and information systems in most of Africa are in a poor state of development; these include agricultural knowledge, marketing social, political, and even knowledge on policies. The rural poor have little or many times no access to the kind of information that will allow by adjustments in their production systems and consequently this gives rise to a narrow choice of options to expand incomes.

Market forces in the era of globalization and liberalization have further worsened the case of resource poor farmers. The liberalized policies have pushed the poor farmers to lower levels of poverty as they depended on sale of surplus production. This is no longer profitable due to higher production costs and depressed consumer prices this is the case in Kenya where small-scale farmers are not able to sell surplus maize into the market as the cross-border maize and inputs are much cheaper.

The most critical constraints, however, to production is lack of supportive instruments to the farmers. Total lack of affordable credit to farmers and institutional support is critical at this time of deteriorating food insecurity. The farmers are expected to do farming from their own resources and locate their own marketing and this is the reason why as many as can get alternatives opt out of farming to get better opportunities in town. This rural-urban migration has only resulted in another group of the urban poor needing support. This means the crop-based systems in marginal areas have received very little attention and are largely unexploited. This is also true for pastoralism systems.

Conflict. The next cause of food insecurity is the persistent conflict in Africa. Internal and transboundary conflicts abound in Africa. These remove the strong productive people from the rural areas living women and children who are consequently prone to food insecurity.

Within the countries, there is growing insecurity in rural areas where food is grown and many regions have large populations of internally displaced people. This greatly affects food production.

Country	Proportion of Total Population Living with HIV/AIDs (%)	Prevalence in 15- to 24-year olds (%)
Djibuti	6.2	11.4
Eritrea	1.2	n.a.
Ethiopia	4.9	9.7
Kenya	7.2	9.7
Sudan	05	n.a.
Uganda	3.8	5.7

Population Growth. Population growth has been very high in most of Africa resulting in great pressure on the resources available. An example is taken from the Horn of Africa:

Table 1 — Demographic indicators

Country	Average annual population growth 199–B2000 (%)	Total Fertility Rate 1995–2000 (%)	Dependency ratio, 1997*	Population per hectare of arable land or permanent cropland	Contraceptive prevalence (%)
Djibuti	n.a.	n.a.	79.8	n.a.	n.a.
Eritrea	3.8	5.7	89.4	5.0	8
Ethiopia	2.5	6.3	95.5	4.1	4
Kenya	2.0	4.5	91.8	4.7	33
Somalia	4.2	7.3	n.a.	4.7	n.a.
Sudan	2.1	4.6	78.9	4.7	8
Uganda	2.8	7.1	107.9	5.4	15

Notes: * UNFPA, 1999, The state of world population.
** UNDP, 1999, Human development report.

Setting the Priorities for Action

At the World Food Summit in November 1996, the heads of states and government for round the world and European Community pledge their commitment "to achieving food security for all and to an ongoing effort to eradicate hunger in all countries, with an immediate view to reducing the number of undernourished people to half their present level not later than 2015."

The trends in developed countries and developing countries are clearly different with agricultural playing a critical role in the economies of the low-income developing countries. In these countries, 70B80 percent of the population live and depend directly or indirectly on agriculture.

This is to be compared with only 2B5 percent of the population in the European Union and other high-income countries. The trends in Sub-Saharan Africa are still very discouraging with level of malnutrition and poverty increasing other than reducing as already indicated by projections by IFPRI. Sub-Saharan Africa is the only region in the world in which the number and percentage of children who are malnourished is expected to rise rather than fall over the next 20 years. This is based on assumptions of increased cereal production.

Actions Needed

1. *Commitment to food security.* The governments should demonstrate commitment to food security by:
   a. Creating an enabling institutional framework to support farming institutional mechanism to support farmers in input provision, credit, and right policies should deliberately be put in place.
   b. Increasing budgetary allocations to agricultural sector.
   c. Governments respecting the right to food as a human right and give all the attention this deserves.
   d. Strengthening environment for producers to do their business putting in place institutional mechanism to support farmers in input provision, credit, and right policies.

2. *Agricultural production models.* Deliberate lessons should be learned from the people themselves to develop sustainable agricultural models for these fragile ecosystems. Greater involvement of people should be encouraged in research work to identify research gabs where the resource poor farmers can benefit form the research.

   The underlying recommendation is to learn more from the actors themselves as to how they have coped with risk over time. However, there has to be alternative livelihoods in these times of changing climatic conditions where farming solely dependent on weather may not be guaranteed.

Conclusion

The African governments ought to perceive it as an obligation to feed their people and give it first priority in planning. Social safe nets must be developed to support the population and not leave them to the controls of nature. This should be done in collaboration with development partners. Real political will should be demonstrated towards this direction in that:

- More resources should be availed to social research to have lessons from Africa for Africa.
- The issue of land should be addressed in view to releasing land for food production other than purely human settlement.
- There needs to be a radical change in many African countries with better focused planning in view of food production.
- Redefinition of a farmer who is expected to produce food for the city population done by each government.
- The land utilization trends in Africa need to be reversed if we are not to end up with housing estates in all our countries and no food.

(It can be done.)

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SUMMARY NOTE

Panel Discussion: Empowering Low-Income Women
Panelist: Wilberforce Kisamba-Mugerwa, Minister of Agriculture, Animal Industry and Fisheries, Republic of Uganda
Title: Empowering Low-Income Women for Enhanced Food Security in Sub-Saharan Africa

Women and Food Production: The Sub-Saharan African Context

As the global concern for food security increases and translates into more innovative strategies, the role of women in fighting the current food crisis cannot be underestimated. Subsistence agriculture still dominates the working lives of more than half the world's women. In Africa, women produce 78 percent of the continent's food, including meat and staple grains, on subsistence and small land holdings with very limited access to production resources, land inclusive. In Uganda, women contribute over 80 percent of the total agricultural labor force with most of the time allocated to food production and processing.

For many decades, the women of Africa with very poor technologies have largely contributed to the sustenance of the continent. Their contribution to survival in most African governments is key and cannot be underestimated.

The Needs of Women Farmers in Sub-Saharan Africa

The needs of women farmers revolve around their strategic and practical gender needs that demand both long-term and short-term solutions for improved performance in farming. Such needs include:

Improved access to agricultural advisory services. Agricultural extension, being male dominated, continues to target and benefit men much more than women in most developing countries. Even then, the focus of extension tends to be more on cash crops and larger enterprises that often underscore and leave out the needs of smaller farmers, particularly women, for advice on food production and food security concerns. This further marginalizes women's efforts to achieve efficient management of smaller livestock for sustainable livelihood.

Improved access to rural financial services (credit/loans). Women farmers, due to lack of collateral and limited scale of enterprises, have for long been disadvantaged in accessing credit and loans. The terms of access to rural loans tend to favor more commercial enterprises leaving out important aspects related to food production and household nutrition. The long distances involved in accessing rural financial service centers are prohibitive to rural women who have not only time constraints but also limited ability to afford rural transportation. The situation is exacerbated by the fact that the rural financial agencies are more commonly urban based.

Access to land and other productive resources. Women's access and control over productive resources remains lacking in most sub-Saharan Africa. Legislation over land tenure systems needs to take into account the important role of women play in providing food for their families. Agricultural inputs have remained inaccessible to women, therefore perpetuating drudgery in their farming efforts.

Poor market infrastructure, information, and facilities. Low-income women have tended to be marginalized by distant and poor market facilities. Insufficient emphasis has been put on market facilities that attract the participation of women in marketing.

Moreover market information remains restricted to the literate as well as more urban-based farmers. Because of persistent low levels of literacy among low-income women, information regarding farming and particularly food security does not readily reach women farmers. Besides, most of the information packaging and dissemination channels are unsuitable for them.

Lack of appropriate technologies. Production among women has been predominantly labor intensive, most of the farm work being reliant on family and child labor. Agricultural research needs to focus more on technologies relevant and appropriate for women's enterprises, with more consideration put not only on relevance but also on affordability and accessibility of such technologies. In addition, the required technologies should be labor saving, yield enhancing, and environmentally friendly. Agroprocessing technologies are paramount, as these would help women add value to their agricultural products that fetch a higher price in addition to enhancing their livelihoods and that of their families.

Training. Women need to be targeted as important stakeholder groups for farmer training. Such training should be tailored to meet the gender specific needs of women and should further take into account women's reproductive roles related to child care and provision of food and care for their households. The fact that women are constrained by time due to domestic work needs to be taken into account when designing farmer-training programs.

Redesigning Agricultural Programs to Meet the Needs of Women Farmers

Gender responsive agricultural and rural development policies. As African economies undergo social and economic transition for enhanced food security, there is need for prioritization if women's empowerment generally but specifically in the agricultural sphere. As is widely acknowledged, women continue to be the majority the world's poor and yet responsible for producing most of the world's food. Agricultural policies and programs need to address issues related to the low status of women as well as their needs in order to improve their production capability.

Participation and involvement of women in identification, design, implementation, and monitoring of agricultural programs. Agricultural programs need to largely recognize women specific needs, abilities, and contributions as key stakeholders. This will facilitate the process of articulating resource requirements for addressing these needs.

In order to enable women participate better in alleviating the food crisis in Sub-Saharan Africa, they need to be involved as key participants in development planning of agricultural programs at all levels. In Uganda, the development process of the Plan for Modernization of Agriculture (PMA) took into account views of men and women farmers. This was the most appropriate way to ensure that women articulate their specific needs and constraints in attempts to modernize agriculture while enhancing food security.

Production among women has been predominantly labor intensive, most of the farm work being reliant on family and child labor. Agricultural research needs to focus more on technologies relevant and appropriate for women's enterprises, with more consideration put not only on relevant but also on affordability and accessibility of such technologies. In addition, the required technologies should be labor saving, yield enhancing, and environmentally friendly. Agroprocessing technologies are paramount, as these would help women add value to their agricultural products that fetch a higher price in addition to enhancing their livelihoods and that of their families.

Implications of HIV/AIDS for women farmers. The increasing negative impact of HIV/AIDS on agriculture in Sub-Saharan Africa has resulted into women's increased work burden as well as increasing poverty status. The changing nature of rural households specifically the emergence of female-headed households, orphan-headed households, and the limited labor and time available for food production due to care of sick relatives and attendance of funeral ceremonies has rendered poor households even more vulnerable to food insecurity. This emergent situation which is likely to get worse in the coming years, calls for new approaches to planning food security interventions that take into account the realities posed by the scourge. It is paramount to reconsider the technology needs among the emergent labor force structure for production, processing, and postharvest handling of food crops.

Improved access to market information and infrastructure. Emphasis on the role of the market in creating income-generating opportunities for low-income women should be considered a key pillar in designing modern agricultural programs. Women need access to relevant market information that will enable them make meaningful enterprise selection. Market outlets need to be opened up within proximity of the rural communities in order to enable women avoid exploitation by middlemen.

Gender disaggregated data in agriculture and rural development. Recognition of rural women's economic potential needs to be adequately voiced on the development agenda in Sub-Saharan Africa. Women's contributions should be reflected in national statistics used for planning, guiding policy, and budgeting. The need for gender disaggregated statistics in agriculture and rural development needs to be articulated and capacity built to mainstream the use of such data, the ultimate goal being to enhance the capabilities of women in food production through gender targeting.

Improved gender responsive policy for agricultural research and advisory services. Agricultural research in the new millennium needs to be focused on the prevailing constraints identified by farmers and more specifically by women farmers for food production as well as improved nutrition levels. This will promote innovations in farmer-led and demand-driven research in order to address the concerns of increased productivity and production of food crops in a sustainable manner. Fast-maturing and high-yielding food crop varieties will greatly enhance the food security needs among poor communities.

Agricultural advisory needs for women farmers need to be better targeted and delivered. New approaches, including privatization of advisory services, should ensure that women's abilities to demand and pay for such services are addressed in order not to marginalize women further.

Capacity enhancement for women farmers organizations. Rural women's groups and associations need to be strengthened in the bid to realize more sustainable food security. The need for focused training and extension delivery to women groups will largely improve access to agricultural knowledge and information among farming women and communities.

Conclusion

There is need for an intensive effort and emphasis on mainstreaming gender in agricultural programs. This will facilitate the entry of women as active decisionmakers on issues that relate to food security and income generation. The present debates on food security in Sub-Saharan Africa should focus more on the constraints faced by women as the major food producers. The food situation for Sub-Saharan Africa will be improved with more relevant technologies for poor farmers being developed and promoted, community participation outreach initiatives adopted, accessible advisory and rural financial services, and improved market information flow targeted to rural farming communities.

Note: The views expressed in this summary note are those of the author and are not necessarily endorsed by or representative of IFPRI or of the cosponsoring or supporting organizations.

SUMMARY NOTE

Keynote Speaker: Michael Lipton, Research Professor of Economics, Poverty Research Unit, Sussex University

Title: Escaping Poverty: The Poor's Productive Resource Needs: A Keynote Address[1]

Early poverty reduction, rural and farm resources for the poor, transition and education

The agreed aim of development policy is to slash extreme poverty. The UN-OECD international development targets" for 1990–2015 aim to halve the proportion of the world's people who are dollar-poor, i.e. who live on less that a dollar a day. Developing countries are producing "poverty reduction strategy papers" on how to achieve this, and to monitor progress. Developed countries are reorganizing aid, for each developing country, in support of the poverty reduction effort. Some of all this is rhetoric, but much is genuine.

Most of the poor are rural; their first need is food; and past success in mass poverty reduction rests heavily on getting resources for increased staples production, productivity, and consumption to smallholders and farmworkers. Yet most ***developing-country*** poverty reduction strategies are macroeconomic. They say little about resources for agriculture or rural development, or how to get those resources to the poor. ***Developed-country*** aid to agriculture has collapsed, from over a third of all aid in the early 1980s to 12 percent now. Policymakers act as if world poverty were best cured in towns: by increasing urban resources and getting them to the urban poor.

Many people think this makes sense: the poor are moving towards cities. But this is seldom very fast or successful. Seven out of 10 of the world's dollar-poor are rural. On the best projection, half the world's poor will still be rural in the year 2035! Also, extra urban workplaces cost far more than rural and farm workplaces—more in equipment, education, and infrastructure. Perhaps that's why most programs to help the urban poor create, not income and work, but better shelter. That is desirable, but ***welfarist***; it seldom pays for itself. On the other hand, in rural areas many programs, some very successful, have slashed poverty by ***productive***, and if well chosen sustainable, methods: water control, better seeds, microfinance, rural public works, land reform. Getting productive resources to the *rural* poor not only focuses on where the poor are, and can be cost-effectively reached. It may be the most effective way to attack *urban* poverty, by reducing the flow of migrants to the cities, where they push the poor's wages down and prices up.

Some say that, while poverty reduction requires rural resources for the poor, they should not be geared to farming, because the rural poor increasingly depend on nonfarm income and work. But rural trade, transport, and construction need customers. These are mainly smallholders, and the farmworkers that these employ. In areas of mass poverty and widespread dependence on stagnant, low-productivity or very unequal farming, poverty reduction *starts* by raising the productivity and amount of resources in the hands of poor agriculturists. Only then, as a rule, can the poor make major gains in nonfarm income.

In early development it is extra resources—technology, skills, land, water—for extra local food staples production that the rural poor need most. Usually, they get enough food only when they produce it themselves, or get paid work from those who do. In Asia and sub-Saharan Africa (which contain 93 percent of the world's dollar-poor), well over half of all employed and self-employed people still depend on farming—mostly staples—as their main income source. The proportion of the poor is perhaps two-thirds. Moreover, of the total value of consumption by the dollar-poor, 70 percent is food (50 percent is staples), most produced by poor local farmers or farmworkers.

[1] This note, especially section 3, rests heavily on the *Report on Rural Poverty* of the International Fund for Rural Development (Rome 2001), for which I was "lead scholar". Responsibility for this note remains mine.

No wonder that, in *early* development, rapid poverty decline almost always required fast growth of cereals yields, farm output, and rural employment. In China 1977–85, India 1975–89, Mexico in the 1970s, Indonesia in the 1980s and elsewhere, fast staples output growth **and** substantial shares of land and farmwork for the poor—often due in part to land reforms—were instrumental in rural poverty reduction. Less costly, more reliable food staples cut urban poverty too: for example, in India from 1957 to 1994, rural *and urban* poverty fell fastest when, and where, farm output grew faster (faster industrial growth did not speed up either rural or urban poverty reduction). But the poor need *resources* to gain much, even from agricultural growth. In Latin American countries—where the poor control a tiny proportion of land, while giant farms employ few people per hectare—agricultural growth does far less to reduce poverty than in Asia or Africa.

Poverty reduction does not depend on local food farming and employment for ever! A time comes for ***poverty reduction transition***. In the 1980s and 1990s most East and Southeast Asian countries have succeeded —except for some dryland and upland regions, and some minority groups—in parlaying pro-poor farm growth into pro-poor cash-crop, rural nonfarm, and small-town development, as with China's township and village enterprises. But success came mainly because farm growth in 1960 – 85 had been fast and broad-based, usually smallholder-based, often (as in China, Korea, and Taiwan) during or after land reform. From the mass of dollar-poor—over half of rural East Asians around 1965—came a broad class of potential entrepreneurs, savers and managers, sufficiently food-secure to function first as progressive small farmers, cash-crop growers, and buyers of nonfarm products, and later in the production system for such products.

A key resource—enabling East and Southeast Asians (and many South Asians) to move from reducing their poverty by better food farming, towards doing so through nonfarm and urban work—was education. In particular, not only the poverty reduction transition, but also the efficiency both of economic change and of educational systems, depends on reasonably adequate and equal access to education by talented persons hitherto often denied this resource: children of the poor, girls, many rural people, and some minority language groups. In some Indian States, most of rural Pakistan and much of West Africa, fewer than 1 in 3 rural women have completed primary school. In a competitive world, few uneducated women will gain much from dynamic forms of nonfarm production. So the new growth sectors are denied efficient workers, and women are denied this escape from poverty. Where farming is progressive (though not otherwise), it too grows much faster where resource change is managed by literate, numerate farmers and workers. Yet **the lags of rural areas, women, and minority groups in educational resources** (as in health, and in poverty) **are in most developing countries large and not shrinking**. Both to accelerate pro-poor farm progress, and to ease its subsequent "parlaying" into pro-poor non-farm and urban growth, many countries must urgently accelerate the spread of literacy, numeracy, and access to education to rural, remote and female populations. However, two warnings are needed.

- First, *today's* workers—not just tomorrow's—need basic education to escape poverty, yet many have passed "school age" unschooled. The average age of the workforce is rising in Asia and Africa, mainly because fertility started declining in the 1970s or the 1980s. It is new entrants to the workforce whose schooling can be improved. But in most low-income countries they are a sharply falling part of the workforce. This sharply reduces the speed at which, by just sending children to school, the education of the workforce can be improved! More and more, equipping poor workers with resources to escape poverty requires educating adults too.
- Second, though there can be a high rate of return—also in terms of reduced poverty—to extra education, this depends on other requirements for economic growth. Literacy and numeracy do help poor people to select and adopt (or adapt) new farm methods, and nonfarm activities, better and faster.

But if new methods and activities are not available, profitable or readily traded—or are denied to the poo —education alone may not permit escape from poverty.

The switch to a non-rural emphasis, in getting resources to the poor and thus reducing extreme poverty, makes sense in lead areas of Southeast Asia, South and East China, and parts of India and Latin America. It makes no sense in the poverty heartlands where at least 80 percent of the world's 1.2 billion dollar-poor still live. Poverty reduction has as yet hardly affected most of Africa. In china and India the poorest are increasingly concentrated in "backward" areas. In many of these, poverty and growth returns to much rural investment—agricultural research, rural roads, education—are now higher than in the lead irrigated areas, where poverty has been slashed already. So there is a strong efficiency case for moving resources to some of the poorer rural areas.

Has "the State" a role in moving "resources" to help the rural poor to cut poverty?

Some claim that the State cannot bring the rural poor the resources they need to reduce poverty—that State withdrawal from rural areas, apart from basic law-and-order functions, would help the poor. There have been big follies and evils, harming growth and worsening inequality, in State-based farm production, regulation and extraction. But the State is not the ***source*** of folly, evil, or urban bias, but the ***reflector*** of society's capacity to control these, of its values, and of its power-structure. In successful societies, often open or democratic, the State has been *held* to a big positive role in rural poverty reduction: not just providing "public" goods, but building small-farm productivity, supplying the poor with schools and health, cutting land inequality:

- Many essentials of achieving early farm productivity growth, or of routing it to the small and employment-intensive—farm research, rural roads, some aspects of irrigation and of finance—pay socially but not privately. **Some States seriously try to provide these; others do not**.
- Better health and education make employment growth more pro-poor, but the poor can seldom afford them. **Some States seriously try to provide these; others do not**.
- Changed incentives, taxes, laws, consensus-building are needed for "normal" (not revolution- or invasion-driven) land reform. **Some States seriously try to provide these; others do not**.

There is a new "window of opportunity" for successful State action to get the rural poor the resources they need to escape poverty. In most of Asia and Africa, fertility ***declines*** in 1970–2000 promise dramatic ***rises*** in "labor supply" (adults aged 15–59) relatively to dependants in 1995–2025. That ratio is scheduled to *double* in Kenya and Bangladesh. In the 1970s, smaller rises greatly helped poverty decline in East Asia, thanks to labor-intensive small-farm growth. This created increasingly rewarding productive work, so each extra working adult could provide better food, education and lives for his or her (fewer) dependants. This *might* work in South Asia and Africa in 2000–2025, but only if the improved ratio of workers to dependants reaches poor rural areas, and if the workers find affordable workplaces. For this, State action is needed to shift resources. First, fertility decline has long begun, even for poor groups in many lagging rural areas, but must be speeded up by the right (costly) incentives: lower child mortality, more female education. Second, even with fewer dependants, poor rural workers can cut family poverty only with better water control, seed technology, rural infrastructure, and in some areas land reform, to arouse small-farm productivity and employment from their sluggish growth in the 1990s.

Some people oppose many State actions to get resources, of growing productivity, to the rural poor on environmental grounds. It is claimed that increasingly scarce and threatened land-water resources can no longer support substantial (or small-farm or labor-intensive) farm growth. Assorted lobbies—against dams,

pesticides, some fertilizers, and even the (unusually low-risk) methods of plant breeding based on genetic modification—have deterred some promising forms of spending by developing-country governments and donors in support of rural poverty reduction. In fact, fragile environments can be protected, against migration and over-exploitation by the desperate poor, only by scientific resource use and management (including more intensive farming) and resource shifts to the poor, especially in *better-endowed* soil-water environments.

However, the spreading water crisis—created by a partly justified shift of water to industrial and urban-domestic use, and probably exacerbated by global warming—does threaten, especially in drier areas, to constrain resource transfers to, and productivity growth for, the rural poor, and even the improvement of their often appalling drinking water and sanitation. A solution requires:

- better water markets and freer pricing as stressed by the World Water Commission, but also
- transfer of water-yielding assets, to the poor as families and as user groups, and
- a new thrust in technologies to use, economize and recycle water: a blue revolution as great as the last one, the taming of water for agriculture in Asia over two thousand years ago.

Meeting the dire water needs of the rural poor, amid tightening water constraints, demands scientific solutions. Yet research is underfunded and often undervalued, isolated and low-prestige.

Apart from water technology and "water reform," the sharp fall in yield growth in main food staples in the developing world—3 percent yearly in the 1970s, barely 1 percent now—and hence in employment growth, is for various reasons unlikely to be reversed without remedying the global misdirection of biotechnology research, away from the food needs of small farmers and workers, towards the marginal problems of the rich. Nor, without gene transfer from other sources, are we likely to see rapid gains in the yields or even the robustness of crops such as millet, sorghum, and some tubers, already adapted to the fragile conditions of semi-arid or upland areas. States need to take the lead in turning round, and reviving, the water and seed aspects of science-based agricultural development. The Green Revolution showed that the gains from this can be steered to poorer farmers and farm workers (no more environmentally depleting than big capital-intensive farms).But, with most biotechnology researchers, and some of the knowledge, locked into private firms—and with a new scale and type of water research required—the problems are not the same as those of getting Green Revolution research moving and poverty-reducing.

Pro-poor technical progress in seeds and water use has been, and remains, the most important anti-poverty resource that the poor can acquire. It will not be achieved by pretending that poor farmers can escape poverty (i) through indigenous technical skills and research alone—important as these are; (ii) through communications, without farm growth or assets—"let them eat the Internet;" and (iii) through the existing research in biotechnology or water-control "to feed the world." Only State-led public action—supplementing, drawing on, and changing incentives to, private agricultural research—can address these problems.

Productive resources for the rural poor: some other and challenges

Measures that reduce rural poverty cost-effectively are known. Returns to farm research (while hard to measure) are probably very high and certainly not falling. In the World Bank, recent farm\-sector projects show similar returns to other sector-specific projects. Productive rural public works, and microfinance (though seldom reaching the very poorest), have shown their capacity to cut rural poverty.

Progress against rural poverty gains from the poor's involvement in institutions, technology, assets, and markets. Much has been learned, especially in rural finance and common-property resource institutions, about successful devolution and participation. In many fields (water control, credit, public works) it improves project efficiency, though not necessarily the poor's share of project benefits. So-called "social capital"—institutions of community trust and cooperation — also helps cut poverty, if the poor have access to it.

But **the software and the hardware are getting out of line**. Just as policymakers and analysts learn how to get some of the institutions right, farm technology improvement is faltering, water supplies are squeezed, and land distribution to the poor is sporadic. Just as the poor get more involved in the "how" of rural development, the "what"—technical progress, asset control—are slow or threatened. Yield growth has faltered badly since the mid-1980s and has not spread to much of Africa, which is largely "stuck" in crops where research is defensive rather than yield-enhancing. Poverty reduction in Africa—as in some of semi-arid Asia—depends on improved genetic potential, probably mainly via biotechnology. This is also probably needed to provide incentives to invest in land-water management. Africa has only 3–5 percent of cropland irrigated (as against 35–40 percent in Asia), and almost certainly needs much more irrigation, not all "hydraulically correct" small-scale, for major progress.

Asset control is crucial for rural poverty reduction. In developing countries, small farms are still generally at least as efficient as large, and create much more employment per hectare [though globalization increases small farmers' need for shared marketing, quality-control and credit arrangements, if they are to remain competitive in export crops]. Land reform has been much more widespread, successful, and consensual than is generally believed, and may well be moving up the anti-poverty agenda again. International support for well-ordered action to shift land rights to the rural poor is justified—and, in very unequal conditions (Latin America, Southern Africa), is essential for rapid rural poverty reduction. Also, denial of access to land to women is highly inefficient, as well as unjust and anti-poor; experience in redressing it has been mixed.

In summary, the rural poor need labor-using, yield-enhancing technical progress, especially in staples production, to escape poverty. They also need access to adequate land and, to the extent feasible, controlled water. Education—too often still denied rural people, especially women—is essential for skill acquisition, and for mobility both within and out of progressive agriculture. Returns to outlays that develop such resources (and enable the rural poor to obtain them) are known to be high—at least as high on small farms as on big ones; not systematically less in Africa than elsewhere; and often higher in appropriate rainfed areas than in irrigated "lead" areas.

The poor can gain from liberalization and globalization, but this is much likelier if they obtain the tools, not just to reach markets, but to compete in them. This means education, good advice (but not compulsion) linked to competitive credit, better rural roads if affordable, but also low-cost and if possible competitive means of personal and shared transport and storage. There are indeed niches for information and communication technology in guiding farmers, including some poor ones, to the best market options; but Bill Gates has rightly dismissed "let them eat the Internet" as a way to reduce the poverty of hungry, ill and illiterate persons.

Afterword: Resources for the rural poor and the international poverty targets

In the 1970s and 1980s, a poor person's chances of escaping dollar poverty improved dramatically. If the developing world does as well in 2001–15, the "global development target" for poverty reduction will probably be met: the 1990 proportion of the world's people living on below a dollar a day will be halved by 2015. Unfortunately, poverty reduction was far slower after 1990 than in the 1970s and 1980s. If each main area in the developing world does as well in 1998–2015 than in 1990–98, only 40 percent of the UN poverty reduction target will be met.

The main reason for the sharp slowdown in poverty reduction has been a slower increase in the rural poor's productive resources: land, yield-enhancing technology, water, education, and hence access to productive work. Increasing such resources is crucial and achievable in early development through a focus on agricultural growth, especially smallholder food production, and its technical base in national and international seed and water research; and on access to land for the poor. In 1970 – 88 that happened; since then it has slowed right down,

and so has poverty reduction, while the share of aid going to farming has collapsed. If—but only if—these errors are corrected, the poor can gain sufficient productive resources for the poverty targets to be met.

ABSTRACT

1. Most of the world's poor will remain rural for at least three decades. Low-income countries that achieved substantial poverty reduction almost always did so initially by getting resources to the rural and farming poor, and raising productivity of such resources. This brought rising income from affordable, productive employment, and self-employment, on small farms,—especially to produce staple foods for local use. This is still usually the most cost-effective way to reduce rural and urban poverty, in regions with widespread low incomes and food insecurity. After this, poverty reduction comes to depend on a transition to employment-intensive cash-crop, rural nonfarm, and small-town development. Where the "poverty reduction transition" works, it depends heavily on education, and on correcting anti-rural and anti-female biases in access to it.
2. States, reflecting the societies in which they are embedded, have often impeded rural poverty reduction. Yet it now requires appropriate, and often expanded, State action. This has to make available prerequisites for small farm growth that, while socially profitable, are undersupplied by private firms; and to create laws or incentives that shift such resources to poor (e.g., by land and water reform), and stimulate more employment-creating methods of production. Fertility declines in recent decades is sharply raising the ratio of workers to dependants in many very poor countries—giving a "window of opportunity" for State action to ensure that this is matched by more demand for labor. This is affordable mainly from agriculture, but requires faster, publicly supported technical progress in seed development (almost certainly including biotechnology) and in dealing with the tightening squeeze on rural water supply.
3. State managers have learned much about the advantages of decentralized, participatory institutions in rural poverty reduction. Provided States create the policy environment for such institutions (and do not retreat excessively from their irreplaceable functions), the software will continue to "come right," as recent experience in microfinance, community forest management, and water users' groups shows. But even good software runs badly on dated or rusting hardware: better technology and more assets suitable for poor producers, especially the remote, rural, female poor.
4. Both the real value and the share of agriculture in international aid have collapsed since the late 1980s. Domestically, many States have reduced their efforts for agricultural research, rural roads, irrigation, and land reform. If these trends are reversed, in the context of major national and international effort on seed and water development, the international target of halving dollar poverty in 1990–2015 can be met. However, we are at present achieving well below half that target. There will be no major improvement without a major turn to rural and farm activity—where poverty mainly is, and where it is most cost-effectively addressed.

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SUMMARY NOTE

Panel Discussion: Whose Responsibility Is It To End Hunger?
Panelist: Robert Paarlberg, Professor of Political Sciences, Wellesley College, and Associate at the Weatherhead Center for International Affairs, Harvard University
Title: Which Institutions Must Act?*

To achieve sustainable food security for all, new actions will have to be taken by a wide range of local, national, and international institutions, both in the public sector and in the private sector. What should be the division of labor among these institutions? Figure 1 offers a classification of the institutions that might have to play a role:

Figure 1 – Institutions potentially responsible for acting to end hunger

	For-Profit Private Sector	Public Sector	Not-For-Profit Private Sector
International Level	Multinational corporations (MNCs)	Intergovernmental organizations (IGOs)	International nongovernmental organizations (INGOs)
National Level	National corporations	National governments	National nongovernmental organizations (NGOs)
Local Level	Local private marketers and tradesmen	Local authorities	Grass roots organizations (GROs)

The most logical division of labor between these institutions is for IGOs to provide the global public goods needed to end hunger (e.g., open and stable international food markets, an efficient international famine early warning system, a capacity to deliver timely international food and famine relief, and a well-financed international agricultural research system), while local authorities and national governments provide the necessary local or national public goods. These would include internal peace, rule of law, a stable macroeconomic environment, public health services, universal public education, an adequate rural transport and power infrastructure, and a national agricultural research system. Private companies will never have an incentive provide such goods (public goods cannot be sold, because they are openly available to all), and while some INGOs, NGOs, and GROs may have an incentive to provide such goods, they will seldom have the financial resources or authority to do so. Profit-making companies and not-for-profit NGOs can play a valuable role once these public goods have been provided (once markets are working, once the roads have been built) but the public goods most needed for societies to escape hunger must be provided by public sector institutions.

If we adopt this logical division of labor, with IGOs working at the global level and national or local government authorities working within states, an important observation can be made. In the two regions of the developing world where hunger is still highly prevalent (South Asia and Sub-Saharan Africa) the most important public goods now being under-supplied are local or national public goods, rather than global public goods. By implication, local and national governments have greater room and hence the greater obligation to improve their performance.

At the global level, IGOs are now delivering some necessary public goods with considerable success. Negotiations conducted in the WTO have helped to keep international food markets relatively open. Organizations such as FAO have developed significant famine early warning capabilities. International food aid organizations such as WFP have a strong record in getting food to nations facing short-term emergencies (so long as the governments of those nations cooperate, and so long as those nations are free of violent

* These remarks are extracted from a forthcoming IFPRI 2020 Vision Discussion Paper titled "Governance and Food Security in an Age of Globalization."

internal conflicts). And the international agricultural research centers of the CGIAR have put a significant quantity of internationally usable agricultural research into the public domain. The supply of these global public goods is not completely adequate, but it has been enough to help most geographic regions reduce hunger dramatically. In regions where hunger remains acute, such as South Asia and Africa, global public goods deficits are less significant than public goods deficits at the local or national level.

In South Asia, hunger persists despite the availability of a dependable international food trading system. In fact, hunger persists here in part because some governments in this region have made it a policy (in the name of "self-sufficiency") not to use international food markets. The states of South Asia import only 2 percent of their (inadequate) internal grain consumption from world markets. Governments in this region have also made it their policy, for years, to avoid foreign direct investments by MNCs. South Asia receives only about one-eighteenth as much foreign direct investment as the low- and middle-income countries of East Asia, and only one-nineteenth as much as Latin America and the Caribbean. Given such weak connections between the region and most global markets, hunger in South Asia is hard to attribute to globalization or to some deficit in global governance.

The hunger that persists in South Asia today has origins which are primarily local. In many cases the problem traces back to low farm productivity within rural communities that are situated in non-irrigated dryland areas that experience less than 750 mm of rainfall a year. These disadvantaged farming communities have not yet found a way to make their land productive. Grain yields on non-irrigated land in India average only 0.7 to 0.8 tons per hectare, which is only one third the yield average on irrigated land, and non-irrigated farming in India still accounts for 67 percent of total cultivated area, and struggles to support 40 percent of the country's vast population. Improving the productivity of these poor dryland farming communities will require substantially larger investments by local and national governments in agricultural research, rural infrastructure, and human capital (gender-equal).

In recent decades national governments in South Asia have done a better job of delivering important public goods to their own citizens, and as a consequence rural income has increased and hunger is now finally in numerical decline. The prevalence of child malnutrition in South Asia fell from 61 percent in 1985 down to 49 percent by 1995. The trends in Africa are not yet so favorable. In Sub-Saharan Africa the prevalence of adult hunger is now greater than in South Asia (34 percent versus 23 percent according to FAO), and with population growth the total number of hungry people continues to increase.

Africa's hunger problems are once again mostly local in their nature. Sub-Saharan Africa, a bit like South Asia, has been bypassed by many of the new forces of globalization. Whereas Africa in colonial times was deeply integrated into global commodity markets, Africa today is actually retreating from export trade. Africa's total volume of exported coffee, groundnuts, palm oil, and sugar has been shrinking; it is actually smaller today than it was thirty years ago. Total FDI flows into Sub-Saharan Africa have also become negligible, equaling less than 1 percent of the developing world total. Africa does rely on imports for a slowly growing share of its total grain consumption (14 percent of consumption, compared to only 2 percent for South Asia) but many of these imports are now arranged as food aid or financed through development assistance rather than commercial export earnings. The outside world gives Africa roughly 2.8 million tons (grain equivalent) in food aid every year, and roughly $11.3 billion in net official development assistance. Despite the availability of such global public goods, the number of hungry people in Africa continue to rise.

Hunger persists in Africa today not because of global market malfunctions, but instead because of low productivity growth within Africa's own farming sector. In Africa, average agricultural valued added per farm worker is actually declining. Total food and farm production per capita is also declining. This makes Africa

dramatically different from the rest of the world. FAO data indicate that in the developing countries as a whole between 1970 and 2000, per capita food production increased by 51 percent, but in Sub-Saharan Africa per capita food production decreased by 9 percent. When it comes to ending hunger, some advocates like to argue that "food production isn't the problem," but in Africa lagging agricultural production clearly is a problem because it translates so directly into lagging rural income growth, persistent poverty, and hence persistent hunger.

Farmers in Africa have had trouble increasing their productivity mostly because of public goods deficits at the local or national level. In too many countries in Africa national governments have failed to provide essential public goods such as internal peace, rule of law, protections for individual or community property (especially farmland and grazing land), adequate rural infrastructure (e.g., feeder roads to serve remote farming communities), and sufficient investments in agricultural research. These missing public goods at the national level are holding Africans back. Farmers in Africa hesitate to invest in more productive farming techniques so long as under-funded national agricultural research and extension agencies are unable to demonstrate the promise of those techniques. They hesitate to move beyond traditional subsistence crop production to growing higher value crops so long as poor road systems and high transport costs make it impossible to purchase inputs (such as fertilizer) at a low price, or sell commodities into the local market at a high price. They also hesitate if the roads are not safe from militia solders or bandits, or policemen demanding bribes.

When national governments fail to deliver the essential public goods necessary for domestic food security, GROs, NGOs, and INGOs may try to fill the gap. NGOs are good at working alongside governments, but they seldom have the ability to replace governments. NGOs are not good at keeping or restoring peace in societies divided by violent conflict, or protecting property and enforcing rule of law, or making the research and infrastructure investments needed to supply the rural poor with science-based technology options, or providing an integrated infrastructure for delivery of water, power, and rural transport. NGOs can provide important assistance in the delivery of supplemental services to the poor, if governments provide a conducive environment. When national governments fail or abdicate, NGOs will usually not be a sufficient answer.

To conclude, it is national governments (in South Asia, Sub-Saharan Africa, or elsewhere) that must now take primary responsibility for ending hunger. Hunger has been reduced rapidly in East Asia primarily through successful public goods supply actions by national governments, not through foreign aid, global governance, or a proliferation of NGO projects. Yet outsiders are not free from responsibilities. Donor governments, IGOs, and INGOs can and must play a supporting role. Mobilizing financial and technical resources is one thing outsiders can do. It would help if these resources were more often focused on local or national public goods investments, rather than on simple relief (which does not solve long-term problems) or on what is sometimes called "structural adjustment." Rather than conditioning so much international assistance, lending or debt relief on the pursuit of "policy reform" (which often reforms policies only partly, or only temporarily, or not at all) the donor community should refocus on financing public investments in tangible goods, such as infrastructure, human capital, and research. And most of all, instead of cutting back on international assistance to agriculture at a time when hunger in some regions is still growing, donor governments and IGOs should increase that assistance.

These essential external financial contributions by donor governments and IGOs will not succeed without parallel actions by national governments. But wealthy outsiders will not be credible in prodding local governments to act if they continue to fail in strengthening their own tangible commitment to ending hunger, a project which should engage us all.

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SUMMARY NOTE

Panel Discussion: Complementary Technologies, One Goal: Approaches to Sustainable Food Production
Panelist: Jules Pretty, Professor, Centre for Environment and Society, University of Essex
Title: Agroecological Approaches for Sustainability

A more sustainable agriculture seeks to make the best use of nature's goods and services as functional inputs. It does this by integrating regenerative processes, such as nutrient cycling, nitrogen fixation, soil regeneration, and natural enemies of pests, into food production processes. It minimizes the use of inputs that damage the environment or harm human health. It builds on farmers' knowledge and skills and seeks to make productive use of social capital, namely people's capacities for collective action for pest, watershed, irrigation, and forest management.

The success of modern agriculture in recent decades has often masked significant externalities that affect ecosystem services and human health, as well as agriculture itself. Sustainable agriculture relies more on agroecological and organic approaches to food production. While any farmer or agricultural system with access to sufficient inputs, knowledge, and skills can produce large amounts of food, most farmers in developing countries are not in such a position. The central issue today is to what extent farmers can improve food production with cheap, low-cost, locally available technologies and inputs without causing environmental damage.

Recent Evidence

The University of Essex recently completed an audit of progress toward sustainable agriculture in 52 developing countries. This audit indicated that improvements in food production are occurring through one or more of four mechanisms:

(i) Intensification of a single component of the farm system-such as home-garden intensification with vegetables and trees

(ii) Addition of a new productive element to a farm system-such as fish in paddy rice-that boosts the farm's total food production, income, or both but that does not necessarily affect cereal productivity

(iii) Better use of natural capital to increase total farm production, especially water (by water harvesting and irrigation scheduling) and land (by reclamation of degraded land), enabling growth of additional new dryland crops, increased supply of water for irrigated crops, or both

(iv) Improvements in per-hectare yields of staples through introduction of new regenerative elements into farm systems (for example, integrated pest management) or locally appropriate crop varieties and animal breeds

The dataset contains details of 89 projects (139 entries of crop-project combinations) with reliable data on per hectare yield changes with the introduction of new regenerative elements. These data illustrate that sustainable agriculture has led to an average 93 percent increase in per-hectare food production.

Social Learning for Sustainability

Farmers require timely information on pest-predator relationships, moisture and plants, soil health, and the chemical and physical relationships between plants and animals. Farmers who understand that they can manipulate these agricultural elements, and who are confident about experimentation, are better innovators. Social learning is a vital part of the process of adjustment in sustainable agriculture projects. The empirical evidence indicates that social learning leads to greater innovation, together with increased likelihood that social processes producing these technologies are likely to persist.

Agroecological Improvements

Four types of agroecological improvements have played substantial roles in the food production increases found in the audit: more efficient water use, improvements to soil quality, pest and weed control with minimum or zero pesticide or herbicide use, and redesigns of whole systems.

When better harvested and conserved, water improves productivity. Such water harvesting can lead to extra crops in irrigated lands-particularly important in dryland Asia, where small patches of irrigated rice now produce two crops per year rather than one. In rainfed environments, better water harvesting and conservation improves productivity by enabling new lands to be brought under farming and by increasing cropping intensity on existing lands.

To be sustainable, agriculture must also reduce soil erosion and make improvements to soil organic-matter content, water-holding capacity, and nutrient availability. The adoption of zero-tillage methods and diversification within crops and rotations of crops have been particularly successful approaches to soil improvement. The use of zero-tillage-combined with the use of green manures, herbicides, or both-has spread to 20 million hectares in southern Brazil and Argentina.

In Bangladesh, 80 percent of the 150,000 farmers using integrated pest management now no longer use any pesticides. A positive side-effect of using low-pesticide systems is the incorporation of fish, shrimp, and crabs into rice fields, which increase protein production. Novel research in dryland East Africa has found that the chemical cues (semiochemicals) produced by maize when fed upon by the stalk-borer pest, and which cause increased foraging and attack by parasitic wasps, are also released by a variety of grasses. In western Kenya, 2,000 farmers have adopted new "push-pull" pest-management systems (pushing the pests and pulling in the predators), resulting in 60–70 percent increases in maize yields.

The last area of innovation involves simultaneous changes to many farm variables, resulting in synergistic effects. In Madagascar, the system of rice intensification involves 6-day rather than 40-day transplanting, wide spacing, and regular weeding to encourage root growth, and water stressing during the vegetative growth period. With increased tiller numbers and grains per tiller, yield increases from 2 to 10 t/ha are common. The system is now being replicated in Asia and elsewhere in Africa, despite initial scientific scepticism.

Trade-Offs for Sustainable Agriculture

In most contexts, critical trade-offs and contradictions will emerge from sustainable agriculture. For example, building a road to improve marketing near a forest can aid timber extraction. Closing grazing land to rehabilitate it could force people with no other source of food for their livestock to sell them. An increase in cropping intensity or the amount of land cultivated could increase the household workload, with the burden most likely falling on women and the profits going to men, who are less likely to invest in children and the household.

New winners and losers will emerge with the widespread adoption of sustainable agriculture. Producers of current agrochemical products are likely to suffer market losses from a more limited role for their products. The increase in assets that could come from sustainable livelihoods based on sustainable agriculture may simply increase the incentives for more powerful interests to take over.

Policies for Sustainability

Several things are now clear about sustainable agriculture:

- The technologies and social processes for local-level agroecological improvements are well tested and established.

- The social and institutional conditions for the spread of sustainable agriculture are less well known but have been established in several contexts.
- The political conditions for the emergence of supportive policies are the least established, with only a few examples of real progress.

Most of the sustainable agriculture improvements seen in the past decade have arisen despite existing national policies. Although global recognition of the need for policies to support sustainable agriculture is increasing and almost every country would now say it supports sustainable agriculture, the evidence points toward only patchy reforms.

Some countries have seen state-level support for zero-tillage, watershed and soil management, and participatory irrigation management. A much larger number of countries have reformed elements of agricultural policies through new regulations, incentives and environmental taxes, and administrative mechanisms, and these are having considerable though partial effect. Only Cuba and Switzerland have given explicit national support for sustainable agriculture, putting it at the centre of agricultural development policy and integrating policies accordingly.

Sustainable agriculture needs enabling policy frameworks that deliberately encourage its spread. Policies framed to deliver increased food production must change if they are to help deliver environmental and social benefits, too. In addition, rural development policies and institutions focusing on exogenous solutions to the economic and social problems of rural communities must change to match the needs of community-based and participatory development. Finally, a larger proportion of research and science budgets needs to be directed toward agroecological technologies and better linkages between scientists and farmers.

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SUMMARY NOTE

Keynote Chair: Pedro Sanchez, Director General, International Centre for Research in Agroforestry
Title: The Climate Change—Soil Fertility—Food Security Nexux

No positives for global warming in the tropics

The Intergovernmental Panel on Climate Change (IPCC) Third Assessment Report, states for the first time that the scientific evidence of human-induced global warming is unequivocal and that the latest predictions are much worse than previous estimates. The last 100 years have been the warmest on record, and warming during the last 50 years has a clear human signature. Global temperatures will increase by 1.4–5.8Þ by 2100; sea levels are rising and are expected to reach 14–88 cm by 2100, flooding low-lying areas and displacing hundreds of millions people. Rainfall patterns are changing, El Niño events are increasing in frequency and intensity, arctic ice is thinning and tropical mountain glaciers are retreating.

The consequences of these changes assuming concerted global efforts are also dire, according to this report. Agricultural productivity in Africa and Latin America could decrease by 30 percent this century. Severe droughts will occur in Southern Africa, Southeast Asia, the Mediterranean, and the Central Asia. Wetter climates and more floods are predicted for parts of East Africa and Latin America as well as more smoke and haze problems in Southeast Asia and Central America. Higher worldwide food prices are likely to result, negatively affecting the urban poor.

Major changes are also predicted in the structure and functions of critical ecosystems, particularly coral reefs and tropical forests; a geographic spread of malaria, and increased crop pest and disease pressure in wetter climates. The IPCC reports large global economic losses from the already existing global warming: $40 billion in 1999 (25 percent in the tropics).

The adaptive capacity of people to these global changes varies. Countries with the least diversified agriculture, forestry, and fisheries will suffer the most. Africa is considered the most vulnerable region to global warming.

There is a major contrast between developed and developing countries in terms of who causes human-induced global warming and who pays for the consequences. About 75 percent of anthropogenic CO2 emissions are due to fossil fuel burning, mainly from the North, while the remaining 25 percent is due to changes in tropical land use, especially deforestation. While contributing the least to global warming, it is the developing countries that will suffer the most from it, having the least capacity to adapt. Virtually all the population growth will happen developing countries, and 95+ percent of hungry and poor people live there as well. We need to double food production in developing countries over the next 20–35 years but increasingly variable and changed climates will threaten food production and the natural resource base. Current technologies, policies and institutions are inadequate to meet the challenge of climate change in developing countries.

Adapting crops to thermal stress

Present mean maximum temperatures over much of the tropics where crops are grown are about 34Þ. The IPCC Third Assessment Report indicates that temperatures are going to increase throughout the tropics, regardless of changed rainfall regimes. IRRI has recently found that the fertility of rice flowers falls from 100 percent at 34Þ to near zero at 40Þ, regardless of CO_2 levels in the atmosphere. Any increase in temperature due to global climate change is potentially damaging to rice, to the tune of about 16 percent yield per 1Þ

degree increase. Similar trends have been found in wheat, maize, beans, soybeans, and peanuts.Large increases in grain sterility of cereal and legume crops raises a most alarming food security issue, exacerbating the many daunting challenges the world faces to feed itself in the coming decades without considering climate change. The extent of this threat to root and tuber crops, pasture and tree species in unknown to members of the Working Group at this time. If the rates of rice yield decrease due to thermal stress are broadly validated, and assuming the range in temperature increases in the latest IPCC data (0.14–0.58Þ per decade) we could face a yield decrease in tropical grain crops of 5–11 percent by the year 2020 and a 11–46 percent decrease by 2050. This project is given top priority because it threatens food security the most.

Soil fertility in Africa

The fundamental cause of low per-capita food production in Africa is soil fertility depletion. Small-scale farmers over decades have removed large quantities of nutrients from their soils without returning them as manure or fertilizer in sufficient quantities. This has resulted in a very high average annual depletion rate—22 kg of nitrogen (N), 2.5 kg of phosphorus (P), and 15 kg of potassium (K) per hectare of cultivated land per year over the last 30 years in 37 African countries. This annual loss is the equivalent of US$4 billion in fertilizer. The full potential of genetically improved crops cannot be realized when soils are depleted of nutrients. A recent study shows that while the rates of adoption of improved crop varieties have been similar in Asia, Latin America, the Middle East and Sub-Saharan Africa during the last 38 years, such varieties are responsible for 66–88 percent of the crop yield increases in the first three regions but only for 28 percent in Africa. Soil fertility is the likely biophysical reason behind such differences, and therefore is the logical starting point to tackle hunger in Africa.

The traditional way to overcome nutrient depletion is the use of mineral fertilizers. But fertilizers cost from 2-6 times more at the farm gate in Africa than in Europe, North America, or Asia. Spot checks indicate that a metric ton of urea costs about $90 FOB in Europe, $120 delivered in the ports of Mombasa, Kenya or Beira, Mozambique, $400 in western Kenya (700 km away from Mombasa), $500 across the border in Eastern Uganda and $770 in Malawi (transported from Beira).

A new approach

Such gross price distortions have triggered new approaches, most of them combining organic inputs with mineral fertilizers. An approach using natural resources management has been developed by researchers working with farmers during the last decade, and is now being adopted by tens of thousands of African farmers. It consists of capturing nitrogen from the air via biological N-fixation by leguminous tree fallows, utilizing phosphorus from the many small, indigenous phosphate rock deposits of the region, and transferring additional nutrients and carbon with the biomass of nutrient-accumulating shrubs.

Improved fallows. Leguminous trees of the genera Sesbania, Tephrosia, Crotalaria, Gliricidia and Cajanus are interplanted with a young maize crop and allowed to grow as fallows during dry seasons, accumulating 100—200 kg N ha—1 in 6 months to 2 years in subhumid tropical regions of East and Southern Africa. The quantities of nitrogen captured are similar to those applied by commercial farmers as fertilizers to grow maize in developed countries. After harvesting the wood from the tree fallows, N-rich leaves, pods and green branches are hoed into the soil prior to planting maize at the start of a subsequent rainy season. This above-ground litter plus the tree roots decompose, releasing nitrogen and other nutrients to the soil. Maize yields increase by a factor of 2—4 times as nitrogen deficiency is overcome. Farmers are now establishing tree fallow-crop rotations, one year of trees followed by one crop of maize in bimodal rainfall areas of East Africa, and two years of trees followed by 2—3 maize crops in unimodal rainfall areas of southern Africa. Nitrogen

fertilizer applications at the recommended rates produce slightly higher yields than improved fallows but few farmers can afford them.

This approach is economically and ecologically sound and fits well with farmer customs and work calendars (no surprise, because it was developed together with farmers). High net present values and returns to labor have been recorded with the new fallow-crop rotations. Leguminous fallows capture nitrogen from the air mostly during the dry seasons when there are few viable alternative land uses. In addition tree fallows provide multiple benefits such as producing in-situ fuelwood, capturing leached nitrates from the subsoil, recycling other nutrients, controlling the parasitic weed Striga, improving soil physical properties, and sequestering carbon.

Indigenous rock phosphates. While nitrogen deficiency is ubiquitous in African croplands, phosphorus deficiency is widespread in East Africa and the Sahel. In western Kenya, 80 percent of the smallholder land used for maize is extremely deficient in phosphorus and many of the soils have a strong P-sorption capacity. Utilizing indigenous rock phosphate deposits provides an alternative to imported superphosphates. The mild acidity of most of these soils (pH 5–6) helps dissolve high-quality rock phosphates. Under such conditions direct applications of highly reactive sedimentary or biogenic phosphate rock doubles or triples maize yields 90 percent as efficiently as superphosphates.

Biomass transfers of leaves of the nutrient-accumulating shrub Tithonia diversifolia from roadsides and hedges into cropped fields adds nutrients and routinely double maize yields at rates used by farmers, without fertilizer additions. This organic source of nutrients is more effective than urea when applied at the same N rates, because tithonia also adds carbon that enhances nutrient cycling, increases microbial biomass, decreases P-sorption temporarily and adds other plant nutrients, particularly potassium and micronutrients.

Food security

About 50,000 farm families in subhumid tropical Africa are using various combinations of the three main components with good and consistent results. Farmers and communities report that hunger periods are eliminated when using combinations of these practices, thus achieving household food security and benefitting from a supply of fuelwood produced on farm. Knowledge is being transferred farmer-to-farmer, village-to-village, by community-based organizations and by a multitude of national research and extension institutes, universities, nongovernmental organizations, and development projects.

After the soil's fertility is replenished other factors such as improved crop varieties, integrated pest management, conservation tillage, crop rotations, improved roads, and access to markets, credit and information must come into play, just as it happened in Asia during the Green Revolution.

Poverty reduction

Growing maize in farms of 1–2 hectares can overcome hunger in the household and the aggregate effect could double food production in Africa, but it is unlikely to overcome poverty. After the soil's fertility is replenished however, farmers can begin to take the first steps out of abject poverty by growing vegetables, raising dairy cattle and growing trees that deliver high-value products such as fruits, honey, medicines and high-grade timber which they can sell. Switching from annual crop production to mixed crop-livestock-tree farming is a proven way of asset building. Experience in a poor but market oriented area in western Kenya shows much higher rates of return with tithonia applications on vegetables compared to maize. We have experienced farmers' incomes increasing from US$1 per day to as much as $10.

Health

Anecdotal evidence in western Kenya suggests that those families living on fertility-replenished farms are healthier. The elimination of hunger periods decreases the susceptibility to all sorts of diseases-major and minor. Farm families that are producing milk and other high-value products are also better nourished.

Mitigating climate change

Land-use change from degraded croplands into integrated tree-crop-livestock farming systems that replenish soil fertility and grow high-value trees result in several positive environmental externalities in subhumid tropical Africa. Most tropical soils are depleted of soluble carbon that microorganisms utilize as their energy source. Organic nutrient inputs enhance nutrient cycling, mineralization rates and the transformation of inorganic forms of phosphorus into more available organic ones. Such agroforestry systems also can sequester large quantities of carbon in the tree biomass and soils, about 1–3 metric tons of C ha—1 per year which is 5 to 10 times more than what most other agricultural land-use intensification options can do.

Policy needs

The technologies reported here are effective and more appropriate to current African conditions than those used during the Green Revolution. Replenishing soil fertility in Africa is the key entry point towards eliminating hunger on this continent. It is a necessary but not sufficient condition, and must go hand in hand with improving health, education, governance, infrastructure, and trade. Large and sustained investments are necessary to capitalize and extend these promising leads. Specifically:

- Breed for tolerance of grain fertility to heat stress;
- Implement development projects to scale-up fertility-replenishment practices from tens of thousands to tens of millions of African farm families. Governments should focus on two key bottlenecks-the supply of quality tree germplasm grown in community-based nurseries, and increase the awareness and knowledge of such technologies;
- Develop policies that reduce the disparity between world market and the prices paid by African farmers for mineral fertilizers. Their use must increase drastically and they should be applied together with organic inputs.
- Improve transport and marketing infrastructure for high-value products that are the natural comparative advantage of smallholders in Africa.
- Implement carbon offset projects with farming communities that can help mitigate global climate change in ways that allow farmers to benefit financially from this global environmental service while at the same time eliminating hunger and decreasing poverty.

Investments in integrated community development projects that combine the agriculture, health, and education sectors have a greater chance of success than those that focus on a single sector as the problems are interrelated.

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Appendix 4: IFPRI 2020 Publications Released in Conjunction with the Conference

2020 VISION FOOD POLICY REPORT

2020 Global Food Outlook: Trends, Alternatives, and Choices, Mark W. Rosegrant, Michael S. Paisner, Siet Meijer, and Julie Witcover. Based on the book by the same authors.

2020 VISION BOOKS

A Better World in 2020: Wake-Up Calls from the Next Generation, essay and poster competition booklet

Achieving Sustainable Food Security for All by 2020: Priorities and Responsibilities (summary version of vision document)

Global Food Projections to 2020: Emerging Trends and Alternative Futures, Mark W. Rosegrant, Michael S. Paisner, Siet Meijer, and Julie Witcover

Reaching Sustainable Food Security for All by 2020: Getting the Priorities and Responsibilities Right (revised version of draft "Sustainable Food Security for All by 2020" vision document presented at the Conference)

The Unfinished Agenda: Perspectives on Overcoming Hunger, Poverty, and Environmental Degradation, edited by Per Pinstrup-Andersen and Rajul Pandya-Lorch

Who Will Be Fed in the 21st Century?, edited by Keith Wiebe, Nicole Ballenger, and Per Pinstrup-Andersen

2020 VISION DISCUSSION PAPERS AND BRIEFS

Agricultural Research and Poverty Reduction, Peter Hazell and Lawrence Haddad (Discussion Paper 34 and Brief 70)

Prospects for Global Food Security: A Critical Appraisal of Past Projections and Predictions, Alex F. McCalla and Cesar L. Revoredo (Discussion Paper 35 and Brief 71)

Governance and Food Security in an Age of Globalization, Robert L. Paarlberg (Discussion Paper 36 and Brief 72)

2020 VISION FOCUS BRIEFS

Health and Nutrition: Emerging and Reemerging Issues in Developing Countries, edited by Rafael Flores and Stuart Gillespie (Focus 5)

Empowering Women to Achieve Food Security, edited by Agnes R. Quisumbing and Ruth S. Meinzen-Dick (Focus 6)

Appropriate Technology for Sustainable Food Security, edited by Per Pinstrup-Andersen (Focus 7)

Shaping Globalization for Poverty Alleviation and Food Security, edited by Eugenio Díaz-Bonilla and Sherman Robinson (Focus 8)

Overcoming Water Scarcity and Quality Constraints, edited by Ruth S. Meinzen-Dick and Mark W. Rosegrant (Focus 9)

2020 NEWS & VIEWS

News & Views, December 2001, with lead article on "Articulating a Food-Secure Future"

To download or order 2020 Vision publications from IFPRI's website, go to http://www.ifpri.org/2020conference.

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2020 VISION
FOR FOOD, AGRICULTURE, AND THE ENVIRONMENT

Widespread food insecurity remains entrenched. About 800 million people, one-eighth of humanity, lack the food they need to lead healthy, productive lives. Around 170 million children suffer from malnutrition serious enough to jeopardize their chances to become healthy adults. Why does hunger persist? Are we committed to ending it? Which forces will influence the prospects for food security in the next two decades? Have we set the right priorities for eradicating hunger? Who is responsible for acting on these priorities? These questions formed the core motivation behind this conference organized by IFPRI's 2020 Vision Initiative with cosponsors from the public sector, civil society, and the private sector.

Seven years ago, the 2020 Vision Initiative held its first international conference, which articulated a global vision for eliminating food insecurity. Since then, rapid and pressing changes have taken place: globalization and trade liberalization have accelerated, technological breakthroughs have swept the world, societies are in greater flux, and the environment is more fragile. In providing a forum for discussing food security in this new context, the conference helped an increasingly fluid body of stakeholders examine how best to cope with emerging developments, assess what progress has been made in alleviating food insecurity, and forge a consensus on how best to realign local and global priorities for eliminating hunger once and for all.

The International Food Policy Research Institute (IFPRI)® was established in 1975 to conduct research on meeting the food needs of the developing world in a sustainable way. IFPRI is one of 16 Future℠ Harvest research centers and receives its principal funding from governments, private foundations, and international organizations, most of whom are members of the Consultative Group on International Agricultural Research (CGIAR). IFPRI's 2020 Vision for Food, Agriculture, and the Environment Initiative, launched in 1993, seeks to stimulate a global dialog about the challenges and opportunities related to feeding the world while protecting the earth. The Initiative is guided by an International Advisory Committee of distinguished scientists, policymakers, and civil society leaders. It works with many partners in the public sector, civil society, and the private sector to develop a shared vision and consensus for action on how to meet future world food needs while reducing poverty and protecting the environment.

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